

# PRODUCT CATALOG

## Electrical Transducers & Two Wire Transmitters

Reliable Advanced Precise



In line with the future. Precisely

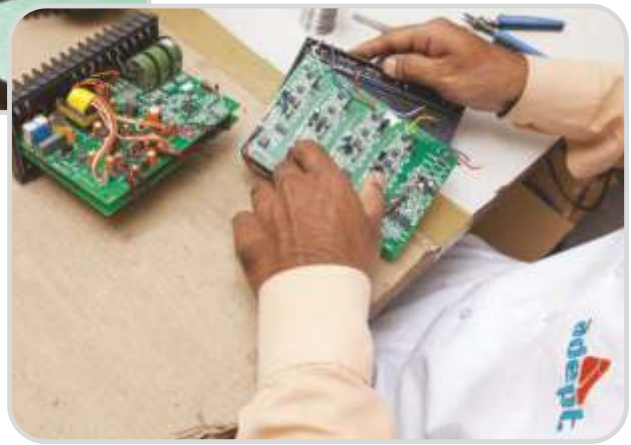
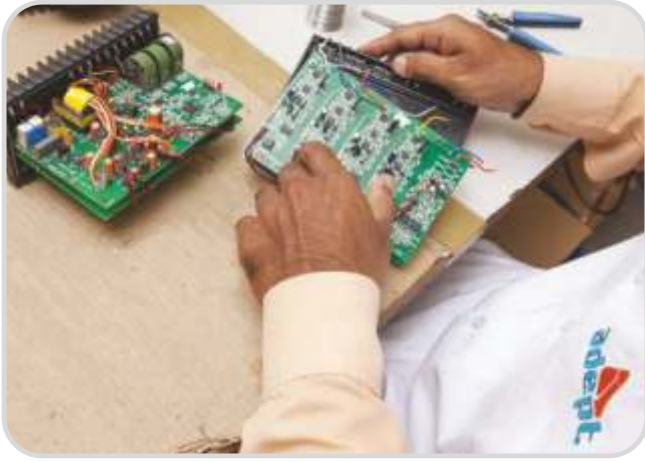
**Adept** is an ISO 9001:2008 company with more than 3 decades of experience in instrumentation. The activities include Electric Transducers, Chart Recorders, Signal Isolators and Flow meters. We have more than 100,000 installations across India and abroad in various types of industries. Our nationwide sales and service network ensures efficient pre and post sales services to our esteemed customers. Our quality products are manufactured in a well-equipped plant in Pune, India.

With an in-house R&D team equipped with the latest design and prototyping facilities, we are in a position to provide solutions for the most challenging requirements. This capability of Adept also helps us to introduce latest technology products and incorporate advanced features in the existing range.



**With our customer-  
centric approach,  
tomorrow belongs to us**





# Series 2000 : Power Line Transducers

**Adept** offers Series 2000 Power Line Transducers for measuring parameters like AC Current, AC Voltage, Line Frequency, Power Factor, Active/Reactive/Apparent Power and Active Energy. These Transducers provide galvanically isolated load independent output proportional to the input parameter range. Standardisation of output assures complete compatibility with the most recording, indicating, telemetering and control equipments. It also reduces maintenance and inventory problems. Use of latest circuit techniques and quality components ensure reliable operation over long period.

The Transducers are widely used in application areas where accurate and reliable monitoring of AC electrical parameters is essential such as Power Utilities, State Electricity Boards, Steel, Cement, Chemicals, Fertilizers, and Petrochemicals.

## Salient Features

- Fully solid state compact design
- State of the Art circuit techniques
- Rugged to withstand harsh environments
- Wide selection of input and output ranges
- Choice of standardised load independent output
- Complete galvanic isolation between Input, Output, Auxiliary Supply
- DIN Rail, Panel Wall mounting
- High long term stability and reliability

## Applications

- Electrical Utilities
- Motor and Power Control Circuits
- Process Monitoring and Control
- Energy Management
- Feedback Control Elements
- Telemetering
- Panel Monitoring, Recording and Supervisory Control and Data Acquisition
- Power Generation, Transmission and Distribution
- Captive Power Plants

## AC Current Transducer 2010

### Operation

The input current signal is scaled down through interposing current transformer. The scaled down signal is fed to a precision rectifier stage, its output is processed to provide DC Voltage / Current output proportional to input AC Current. A combined 3 Phase Input Transducer with 3 Isolated Outputs is also available. An average Output for the 3 Phase Input can also be provided.



### Specifications :

Input Range	: 0 - 1 A, 0 - 5 A, 0 - 1 - 6 A, 0 - 5 - 30 A, (-)1 - 0 - (+)1 A, (-)5 - 0 - (+)5 A AC, or any other
No. of Inputs	: Single, Dual, 3 Phase
Measurement Type	: Average, True RMS
No of Outputs	: One No., Two Nos., Three Nos.
Output Range	: 0 - 1 mA DC, 0 - 10 mA DC, 0 - 20 mA DC, 4 - 20 mA DC, 0 - 5 V DC, 0 - 10 V DC
Auxiliary Supply	: 80 - 300 V AC/DC, 18 - 60 V DC, Self Powered

## AC Voltage Transducer 2020

### Operation

The input voltage signal is scaled down through interposing potential transformer. The scaled down signal is fed to a precision rectifier stage, its output is processed to provide DC Voltage / Current output proportional to input AC voltage. For HT application, Specify PT Ratio and Primary Side Range to derive corresponding Input Range.

A combined 3 Phase Input Transducer with 3 Isolated Outputs is also available. An average Output for the 3 Phase Input can also be provided.



### Specifications :

Input Range	: 0 - 75 V, 3 - 300 V, 85 - 135 V, 0 - 125 V, 0 - 500 V, 175 - 275 V, 0 - 150 V, 50 - 75 V, 150 - 300 V, 0 - 250 V, 50 - 150 V, 300 - 500 V AC, or any other
No. of Inputs	: Single, Dual, 3 Phase
Measurement Type	: Average, True RMS
No of Outputs	: One No., Two Nos., Three Nos.
Output Range	: 0 - 1 mA DC, 0 - 10 mA DC, 0 - 20 mA DC, 4 - 20 mA DC, 0 - 5 V DC, 0 - 10 V DC
Auxiliary Supply	: 80 - 300 V AC/DC, 18 - 60 V DC

## Frequency Transducer 2030

### Operation

The scaled down input voltage signal is fed to a precision frequency to voltage converter stage. Its output is processed to provide DC Voltage / Current output proportional to Line Frequency. Specify PT Ratio if required for tagging purpose.



### Specifications :

Nominal Input Voltage	: 63.5, 110, 240, 415 V AC $\pm$ 20% or any other
Frequency Range	: 45 - 55 Hz, 40 - 60 Hz, 350 - 450 Hz or any other
No. of Outputs	: Single, Dual
Output Range	: 0 - 1 mA DC, 0 - 10 mA DC, 0 - 20 mA DC, 4 - 20 mA DC, 0 - 5 V DC, 0 - 10 V DC
Auxiliary Supply	: 80 - 300 V AC/DC, 18 - 60 V DC, Self Powered

# Technical Specifications

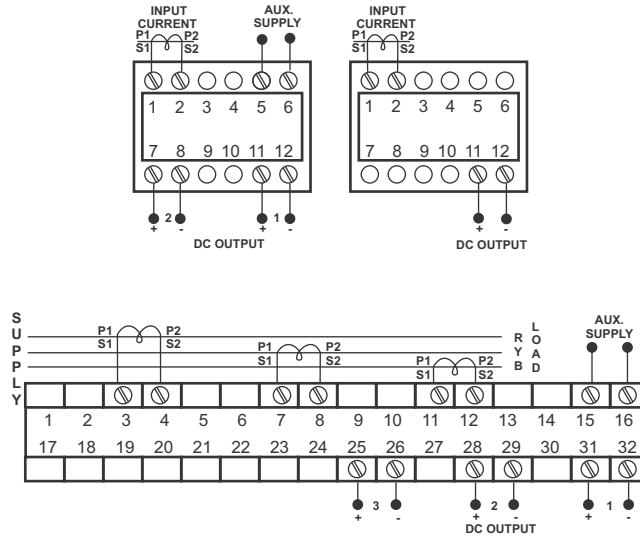
Transducer Types	AC Current	AC Voltage	Line Frequency
Measuring Range	0 - I <sub>in</sub> 0 - I <sub>in</sub> - 6 x I <sub>in</sub>	0 - V <sub>in</sub>	45 - 55 HZ 40 - 60 HZ 350 - 450 Hz
Nominal Input Current (I <sub>in</sub> )	1,5 A AC	—	—
Input Current Range	0 - 100% of I <sub>in</sub>	—	—
Nominal Input Voltage (V <sub>in</sub> )	—	63.5, 110, 240, 415 V AC	63.5, 110, 240, 415 V AC
Input Voltage Range	—	0 - 100% of V <sub>in</sub>	80 - 100% of V <sub>in</sub>
Input Frequency	50, 60 and 400 Hz ± 10%		
Input Current Burden	0.2 VA	—	—
Input Voltage Burden - For Aux. Powered Transducers - For Self Powered Transducers	—	0.5 VA	0.5 VA 4 VA
Continuos Overload Capacity	2 x I <sub>in</sub>	1.2 x V <sub>in</sub>	1.2 x V <sub>in</sub>
Momentary Overload Capacity	40 x I <sub>in</sub> For 1 Second	2 x V <sub>in</sub> For 1 Second	2 x V <sub>in</sub> For 1 Second
Output Load Resistance (R <sub>out</sub> ) - For Current Output - For Voltage Output	Max. 10 V/I <sub>out</sub> (Optional Max. 15 V / I <sub>out</sub> ) 10 kOhm (min)		
Output Ripple	Less than 0.5% of Span (peak to peak)		
Response Time	Less than 500 mSec. (Standard) or 50 mSec. (On request)		
Accuracy Class under Ref. Conditions	± 0.2% and ± 0.5% of Span		
Auxiliary Supply Burden	Less than 4 VA		
Operating Temperature	0 - 55°C, 95% RH Non-Condensing		
Effect of Ambient Temperature	Less than 0.03% of Span per °C		
Isolation Test Voltage between Input / Output / Aux. Supply	2 kV AC, 50 Hz for 1 min. (Isolation between Outputs available on request) (Optional 4 kV AC, 50 Hz for 1 min)		
Insulation Resistance	More than 100 MOhms at 500 V DC		
Impulse Voltage Test	5 kV AC having waveform of 1.2 / 50µSeconds		
Zero, Span Adjustment Potentiometers	Optionally Provided, Externally Accessible		
Terminals	Suitable for 2.5 sq. mm Wires		
Mounting	Suitable for 35 mm DIN Rail, Panel Wall		
Enclosure Type	ABS Plastic Enclosure, Ingress Protection Rating IP 40		

## Reference Conditions

Ambient Temperature	25°C ± 1°C
Input Waveform	Sinusoidal (Distortion factor less than 0.5%)
Input Frequency	50 / 60 / 400 ± 0.5 Hz
Output Load - For Current Output - For Voltage Output	50% of Max. R <sub>out</sub> Open Circuit
Auxiliary Supply	Rated Voltage ± 5%, 50 / 60 / 400 ± 1 Hz

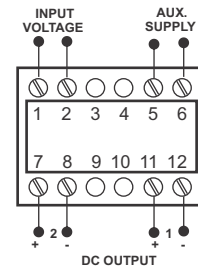
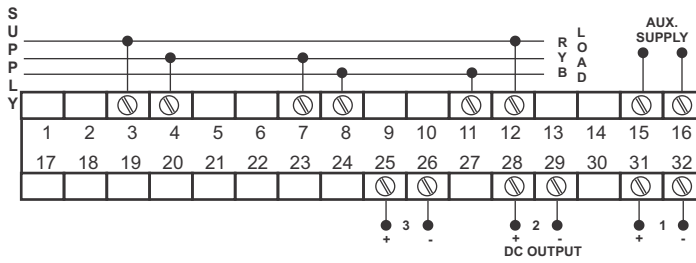
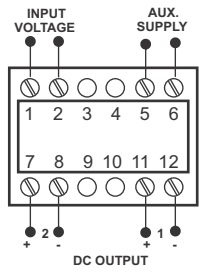
# Wiring Details

## AC Current Transducer

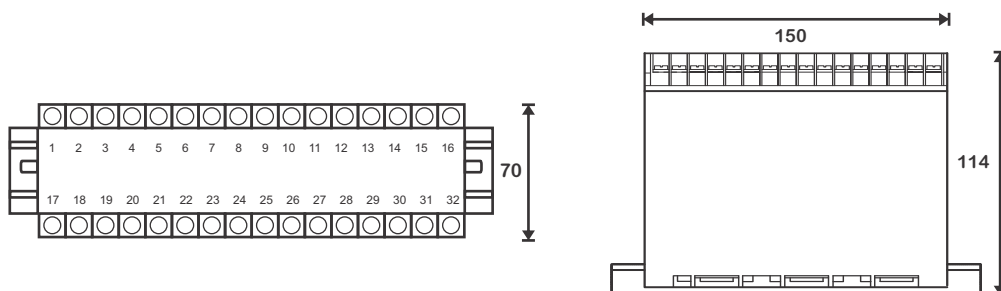
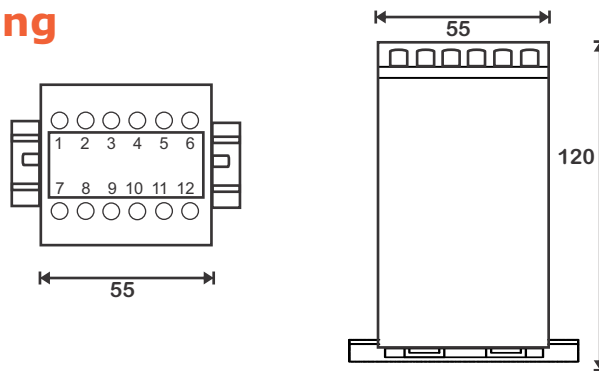


## AC Voltage Transducer

## Frequency Transducer



# Dimensional Drawing



# Power Factor Transducer

## Active, Reactive, Apparent Power Transducers

## Active Energy Transducer

### Power Factor Transducer 2041

#### Operation

The input voltage and current signals are scaled down through interposing potential and current transformers. The scaled down voltage signal is chopped down by the current signal to get a signal proportional to  $v\cos\phi$ . This signal is divided by the voltage signal to get DC Voltage linearly proportional to Power Factor. This output is further processed to provide DC Voltage / Current output signal. This Transducer is suitable for balanced and unbalanced load conditions in 3 Phase 3 Wire, 3 Phase 4 Wire Electrical Networks. Specify CT Ratio, PT Ratio if required for tagging purpose.



#### Specifications :

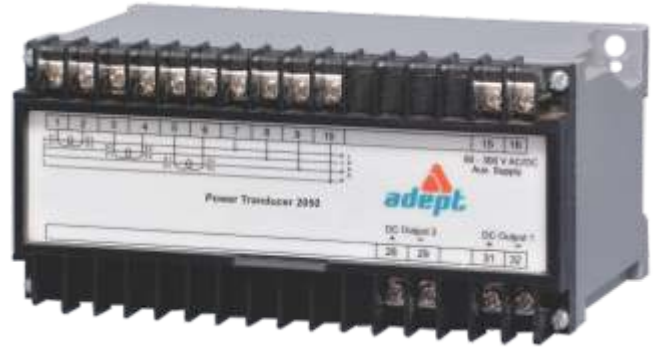
Nominal Input Current	:	1, 5 A AC or any other
Nominal Input Voltage	:	110, 240, 415 V AC
Electrical Network	:	Single Phase, 3 Phase 3 Wire, 3 Phase 4 Wire
No of Outputs	:	Single, Dual
Output Range	:	0 - 1 mA DC, 0 - 10 mA DC, 0 - 20 mA DC, 4 - 20 mA DC, 0 - 5 V DC, 0 - 10 V DC
Power Factor Range	:	Lead 0.5 - 1 - 0.5 Lag, Lag 0.5 - 1 - 0.5 Lead or any other
Auxiliary Supply	:	80 - 300 V AC/DC, 18 - 60 V DC, Self Powered



## Power Transducer 2050 (Active, Reactive, Apparent)

### Operation

The input voltage and current signals are scaled down through interposing potential and current transformers. In case of Reactive Transducers the voltage signal are 90 phase shifted. The scaled down signals are fed to precision multipliers working on time division multiplication principle. The multiplier output is further processed to provide DC Voltage / Current output signal proportional to input Active / Reactive / Apparent Power. For single phase network, only Active Power Transducer is offered. Load condition can be balanced or unbalanced.



### Specifications :

Nominal Input Current	: 1, 5 A AC or any other
Nominal Input Voltage	: 110, 240, 415 V AC
Electrical Network	: Single Phase, 3 Phase 3 Wire, 3 Phase 4 Wire
No. of Outputs	: Single, Dual
Output Range	: 0 - 1 mA DC, 0 - 10 mA DC, 0 - 20 mA DC, 4 - 20 mA DC, 0 - 5 V DC, 0 - 10 V DC
Measurement Type	: Watt, Watt (Export), Watt (Import and Export), VAR (Lag), VAR (Lead), VAR (Lead and Lag) & VA
Auxiliary Supply	: 80 - 300 V AC/DC, 18 - 60 V DC, Self Powered

## Active Energy (WH) Transducer 2051

### Operation

The input voltage and current signals are scaled down through interposing potential and current transformer. The scaled down signals are fed to a precision electronic circuit. It contains multipliers and summation stage which derives total active power. By accumulating this signal, a low frequency pulse output is generated to get active energy information. The Transducer is suitable for balanced as well as unbalanced load conditions.



### Specifications :

Nominal Input Current	: 1, 5 A AC or any other
Nominal Input Voltage	: 110, 240, 415 V AC
Electrical Network	: 3 Phase 3 Wire, 3 Phase 4 Wire
Measurement Type	: Watt Hour
Pulse Output	: Open Collector Voltage Pulse (60 V DC max, 200 mA DC max) or Current Pulse of 4 - 20 mA DC, Load Resistance 500 Ohms (max) (Pulse ON time : 1 Sec)
Pulse Output Capacity	: To Transmit pulses over twisted shielded cable upto 500 meters length
Pulse Resolution	: 1 or 10 or 100 KWH or any other
Status LED	: Blinking LED to indicate pulse transmission
Auxiliary Supply	: 80 - 300 V AC/DC, 18 - 60 V DC, Self Powered

# Technical Specifications

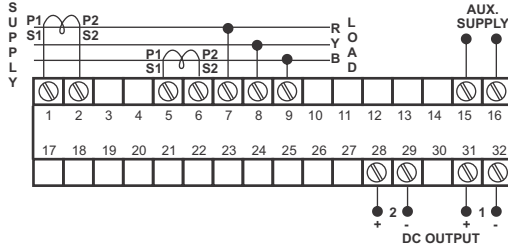
Transducer Types	Power Factor	Active Power, Reactive Power, Apparent Power and Active Energy
Measuring Range	(Lag) 0.5 - 1 - 0.5 (Lead) (Lead) 0.5 - 1 - 0.5 (Lag) (Lag) 0.8 - 1 - 0.8 (Lead) (Lead) 0.8 - 1 - 0.8 (Lag)	0 - $I_{in} \times V_{in}$ For Single Phase 0 - $\sqrt{3} \times I_{in} \times V_{in}$ For Three Phase
Nominal Input Current ( $I_{in}$ )	1, 5 A AC	1, 5 A AC
Input Current Range	25 - 100% of $I_{in}$	0 - 100% of $I_{in}$
Nominal Input Voltage ( $V_{in}$ )	110, 240, 415 V AC	110, 240, 415 V AC
Input Voltage Range	80 - 120% of $V_{in}$	80 - 120% of $V_{in}$
Input Frequency	50, 60 and 400 Hz $\pm$ 10%	
Power Factor Range	—	$\cos \phi =$ Lag 0.5 - 1 - 0.5 Lead for Active Transducer $\sin \phi =$ 1 - 0.5 (Lead), 1 - 0.5 (Lag) for Reactive Transducer
Input Current Burden	0.5 VA	0.5 VA
Input Voltage Burden - For Aux. Powered Transducers - For Self Powered Transducers	0.5 VA 4 VA	0.5 VA 4 VA
Continuous Overload Capacity	2 x $I_{in}$ 1.2 x $V_{in}$	
Momentary Overload Capacity	40 x $I_{in}$ for 1 Second 2 x $V_{in}$ for 1 Second	
Output Load Resistance ( $R_{out}$ ) - For Current Output - For Voltage Output	Max. 10 V/ $I_{out}$ (Optional Max. 15 V / $I_{out}$ ) 10 kOhm (min)	
Output Ripple	Less than 0.5% of Span (peak to peak)	
Response Time	Less than 500 mSec. (Standard) or 200 mSec. (On request)	
Accuracy Class under Ref. Conditions	$\pm$ 0.2% and $\pm$ 0.5% of Span	
Auxiliary Supply Burden	Less than 4 VA	
Operating Temperature	0 - 55°C, 95% RH Non-Condensing	
Effect of Ambient Temperature	Less than 0.03% of Span per °C	
Isolation Test Voltage between Input / Output / Aux. Supply	2 kV AC, 50 Hz for 1 min. (Isolation between Outputs available on request) (Optional 4 kV AC, 50 Hz for 1 min on request)	
Insulation Resistance	More than 100 MOhms at 500 V DC	
Impulse Voltage Test	5 kV AC having waveform of 1.2 / 50 $\mu$ Seconds	
Zero, Span Adjustment Potentiometers	Optionally Provided, Externally Accessible	
Terminals	Suitable for 2.5 sq. mm Wires	
Mounting	Suitable for 35 mm DIN Rail, Panel Wall	
Enclosure Type	ABS Plastic Enclosure, Ingress Protection Rating IP 40	

## Reference Conditions

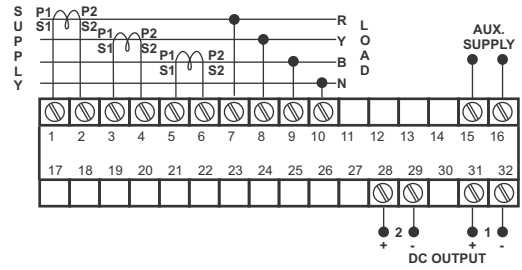
Ambient Temperature	25°C $\pm$ 1°C
Input Waveform	Sinusoidal (Distortion factor less than 0.5%)
Input Frequency	50 / 60 / 400 $\pm$ 0.5 Hz
Input Current Symmetrical for 3 Phase	25 - 100% of $I_{in}$ For Power Factor Transducer 0 - 100% of $I_{in}$ For Active / Reactive / Apparent Power Transducers
Input Voltage Symmetrical for 3 Phase	$V_{in} \pm$ 2%
Power Factor	$\cos \phi =$ 1 for Active Power Transducer $\sin \phi =$ 1 (Lead / Lag) for Reactive Power Transducer
Output Load - For Current Output - For Voltage Output	50% of Max. $R_{out}$ Open Circuit
Auxiliary Supply	Rated Voltage $\pm$ 5%, 50 / 60 / 400 $\pm$ 1 Hz

# Wiring Details

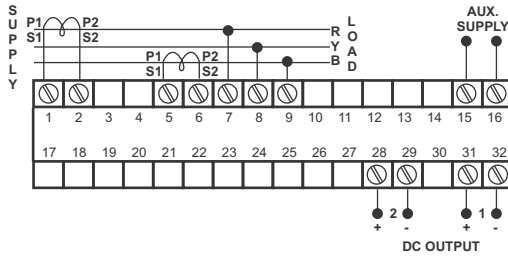
Power Factor Transducer  
3 Phase 3 Wire



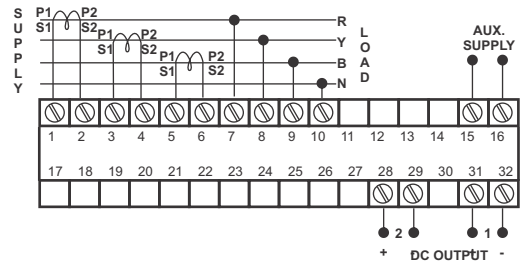
Power Factor Transducer  
3 Phase 4 Wire



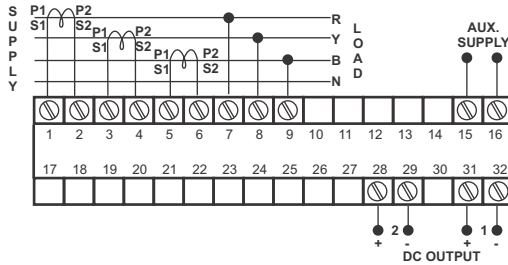
Active / Reactive / Apparent Power Transducer  
3 Phase 3 Wire



Active / Apparent Power Transducer  
3 Phase 4 Wire

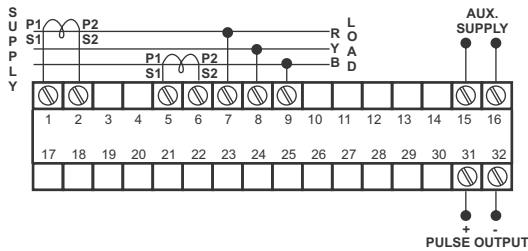


Reactive Power Transducer 3 Phase 4 Wire

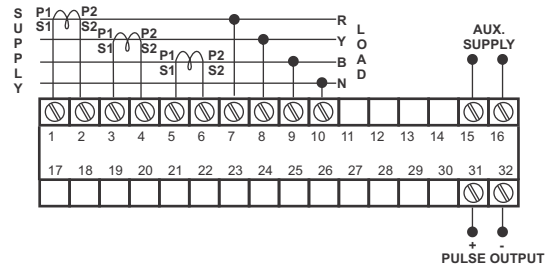


Note : Neutral is not required in 3 Phase 4 Wire Reactive Power measurement

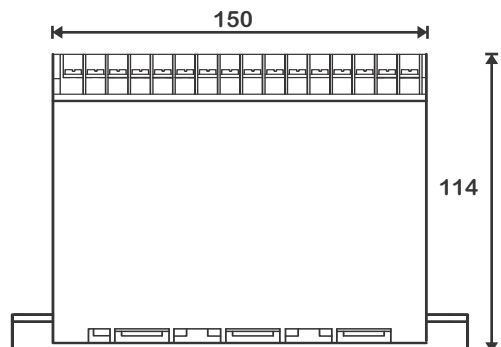
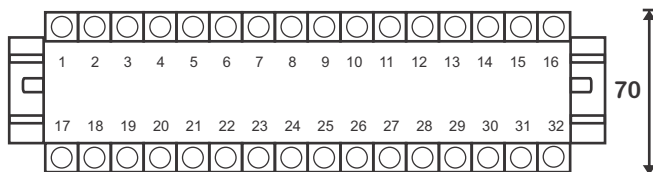
Active Energy (Watt Hour) Transducer  
3 Phase 3 Wire



Active Energy (Watt Hour) Transducer  
3 Phase 4 Wire



# Dimensional Drawing





# Technical Specifications

Measuring Range	
AC Current (Iin)	0 to 120% of Iin
AC Voltage (Vin )	20 to 120% of Vin
Line Frequency	45 to 55 Hz
Power Factor	( Lag ) 0.5 – 1 – 0.5 ( Lead )
Active Reactive Apparent Power	0 to $\sqrt{3} \times 1.5 \times I_{in} \times V_{in}$
Electrical Network	3 Phase 3 Wire, 3 Phase 4 Wire
Nominal Input Current	1A, 5A ( User Selectable)
Nominal Input Voltage	110 V, 415 V AC
Input Current Burden	0.5 VA
Input Voltage Burden	0.5 VA
Continuous Overload	2 times Iin, 1.2 times Vin
Momentary Overload Capacity	40 times Iin for 1 Sec., 2 times Vin for 1 Sec.
Auxiliary Power Supply Burden	Less than 8 VA
Auxiliary Power Supply	80 - 300 V AC/DC, 18 - 60 V DC, Self Powered
Communication Port	RS 485 Half Duplex

## User Selectable Communication Port Setting

Baud Rate	2.4, 4.8, 9.6, 19.2 kbps
Parity	Odd, Even, None
Stop Bits	1, 2
Communication Protocol	Modbus RTU
Number of devices on RS 485 Bus	32

Parameters Measured	Phase to Phase Voltages Phase to Neutral Voltages Phase / Line Currents Line Frequency Phase wise and Total Power Factor Phase wise and Total Active Power Phase wise and Total Reactive Power Phase wise and Total Apparent Power Active, Reactive and Apparent Energy (Energy Parameters not available on 4 - 20 mA output)
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Response Time	Less than 500 mSec
Accuracy Class	±0.5% of Span, Optional ±0.2% of Span
Operating Temperature	0 - 55 Deg C, 95% RH Non - Condensing
Effect of Ambient Temperature	Less than 0.03% of Span per Deg C
Isolation Test Voltage between	2 kV AC, 50 Hz for 1 min. Input, Outputs, Aux. Supply
Insulation Resistance	More than 100 Mohms at 500 V DC
Impulse Voltage Test	5 kV AC having waveform of 1.2 / 50 Sec.
Terminals	Suitable for 2.5 sq.mm wires
Mounting	Suitable for 35 mm DIN Rail, Panel Wall
Enclosure Type	ABS Plastic Enclosure, Ingress Protection IP40

# Two Wire Transmitters 5000

## Salient Features

- High Accuracy
- State of the art circuit techniques
- Rugged to withstand harsh environments
- Reduces noise and protects against transients
- High long term stability and reliability
- DIN Rail, Panel Wall mounting
- Wide Supply range 10 to 30 V DC

## AC Current 5100

### Operation

It provides 4 - 20 mA DC output current proportional to input current. It accepts 1 A or 5 A AC.

### Specifications :

Nominal Input Range	:	0 - 1 A, 0 - 5 A AC or any other
Output Range	:	4 - 20 mA DC



## AC Voltage 5200

### Operations

It provides 4 - 20 mA DC output current proportional to input voltage.

### Specifications :

Nominal Input Range	:	150, 200, 300, 500 V AC or any other
Output Range	:	4 - 20 mA DC



## DC Current 5300

### Operation

It produces a calibrated 4 - 20 mA DC output current directly proportional to the input DC Current. The controlled current output is unaffected by variations in supply voltage, interconnect and load impedance (within specification limits) to provide a highly accurate output current over long distances.

### Specifications :

Nominal Input Range	:	4 - 20 mA DC or any other
Output Range	:	4 - 20 mA DC



## DC Voltage 5400

### Operation

It produces a calibrated 4 - 20 mA DC output current directly proportional to the input DC Voltage. The controlled current output is unaffected by variations in supply voltage, interconnect and load impedance (within specification limits) to provide a highly accurate output current over long distances.



### Specifications :

Nominal Input Range	: 0 - 5 V DC, 0 - 10 V DC or any other
Output Range	: 4 - 20 mA DC

## Temperature 5500

### Operation

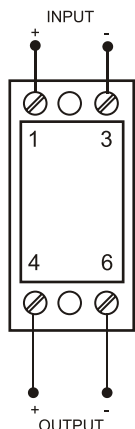
It provides 4 - 20 mA DC output current proportional to input Temperature. PT100 Sensor or Thermocouple (J, K, R, S or T) is used as an Input for the Transmitter. The Transmitter features built-in linearisation for the PT-100 and cold junction Compensation in case Thermocouple.



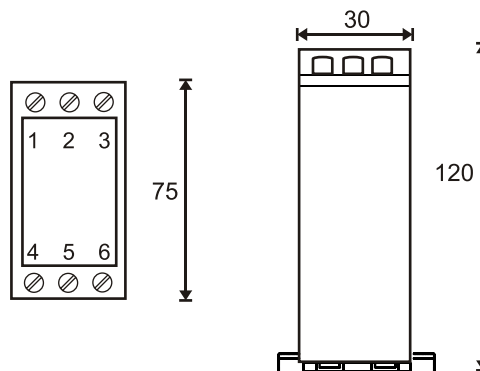
### Specifications :

Sensor	: PT - 100 Sensor, 3 Wire Type or Thermocouple (J, K, R, S, or T)
Output Range	: 4 - 20 mA DC

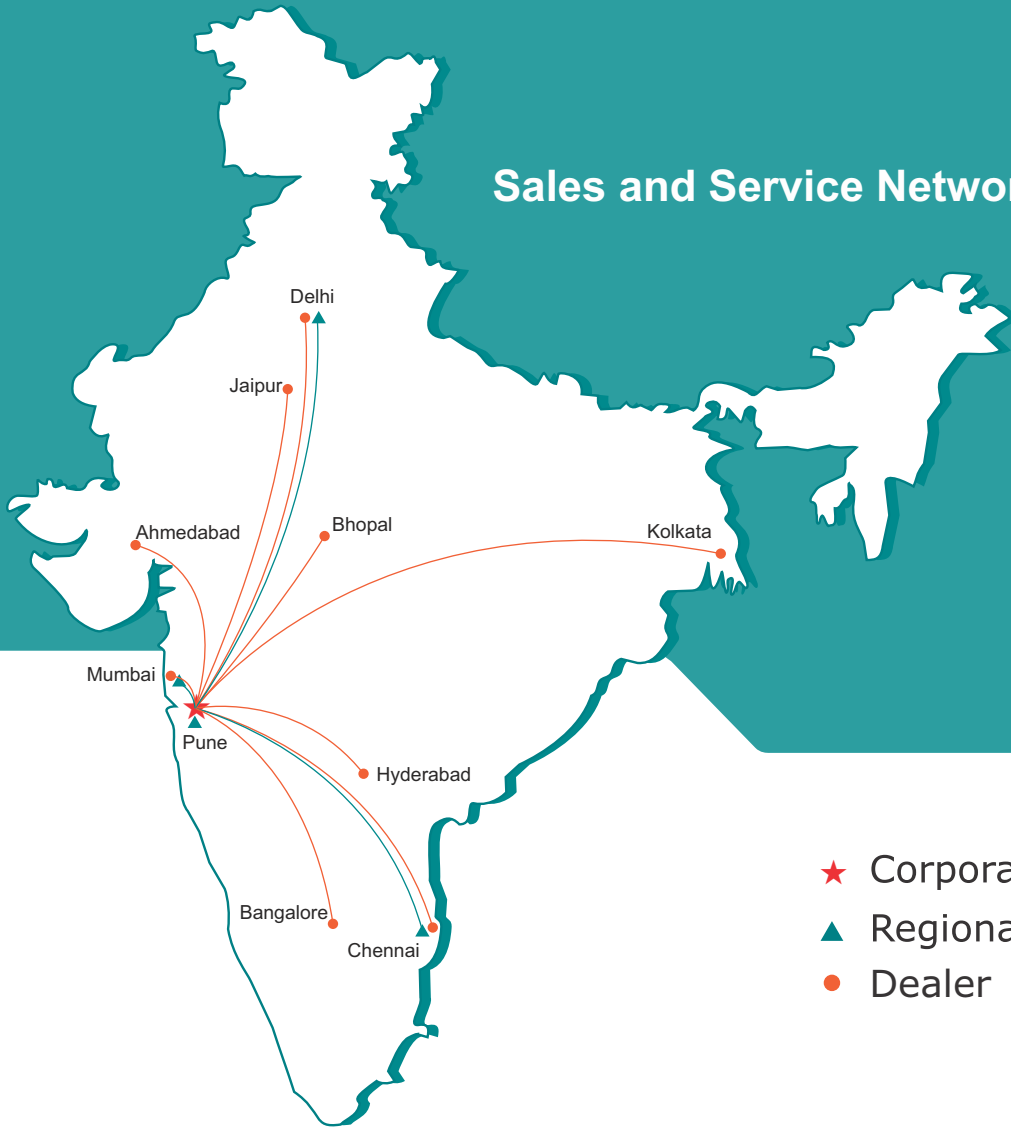
## Wiring Details



## Dimensional Drawing



## Sales and Service Network



- ★ Corporate office and plant
- ▲ Regional Office
- Dealer



## Adept Fluidyne Pvt. Ltd.

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