



Power (Watts & Vars) Transducers

Power transducers measure AC power (active, reactive or both) either directly or through voltage and/or current transformers. The transducer converts the AC power signal to either a DC mA or DC voltage output which is directly proportional to the input signal value.

Models are available for single phase and three phase, balanced and unbalanced loads and are available with a zero based or live zero output. Combined Watt & Var transducers are also available with two galvanically isolated outputs, one proportional to active power (Watts) and the other proportional to reactive power (Vars). All power transducers are available self powered or powered from a large choice of AC or DC auxiliary power options. The 4kV isolated output signals can then be fed to analogue meters, digital meters, PLC's or building management systems.

Models Available

- EP12B** Single Phase Watts
- EP33B** 3 Phase 3 Wire Bal. Watts
- EP33B1CT** 3 Phase 3 Wire Bal. Watts
- EP33U** 3 Phase 3 Wire Unbal. Watts
- EP34B** 3 Phase 4 Wire Bal. Watts
- EP34U** 3 Phase 4 Wire Unbal. Watts

- EQ12B** Single Phase Vars
- EQ33B** 3 Phase 3 Wire Bal. Vars
- EQ33B1CT** 3 Phase 3 Wire Bal. Vars
- EQ33U** 3 Phase 3 Wire Unbal. Vars
- EQ34B** 3 Phase 4 Wire Bal. Vars
- EQ34U** 3 Phase 4 Wire Unbal. Vars

- EPQ12B** Single Phase Watts & Vars
- EPQ33B** 3 Phase 3 Wire Bal. Watts & Vars
- EPQ33B1CT** 3 Ph. 3 Wire Bal. Watts & Vars
- EPQ33U** 3 Phase 3 Wire Unbal. Watts & Vars
- EPQ34B** 3 Phase 4 Wire Bal. Watts & Vars

For converting AC power to a proportional DC mA or DC voltage output

Specification

Reference Standard:

- IEC 688, BS 6253, VDE/VDI 2191

Accuracy:

- Class 0.25 ($\pm 0.25\%$ f.s. max. error)

Input Voltage, U_n :

- 50V to 550V direct connected (specify)
- or VT operated

Input Current, I_n :

- 0-0.7A to 0-7.5A direct connected
- 0-1A or 0-5A CT operated

Overload:

- $1.2 \times U_n$, $2 \times I_n$ continuous
- $1.5 \times U_n$, $30 \times I_n$ for 1 second

Working Range:

- 0 - $120\% U_n$ (auxiliary powered)
- 80 - $120\% U_n$ (self powered)
- 0 - $120\% I_n$

Frequency:

- 50 or 60Hz

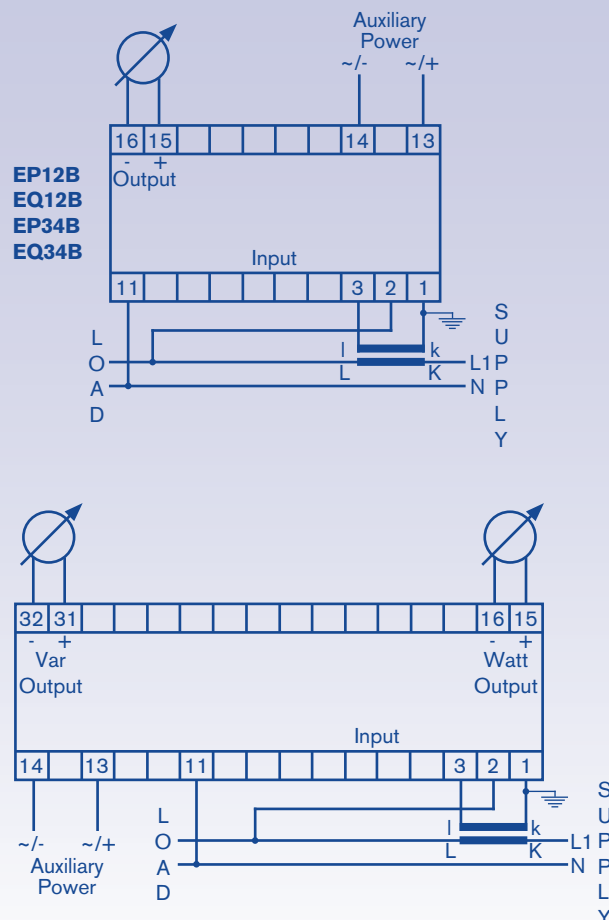
Burden:

- Current circuit $< 0.3VA$
- Voltage circuit $< 0.2VA$ (aux. powered)
- Voltage circuit $< 3VA$ (self powered)

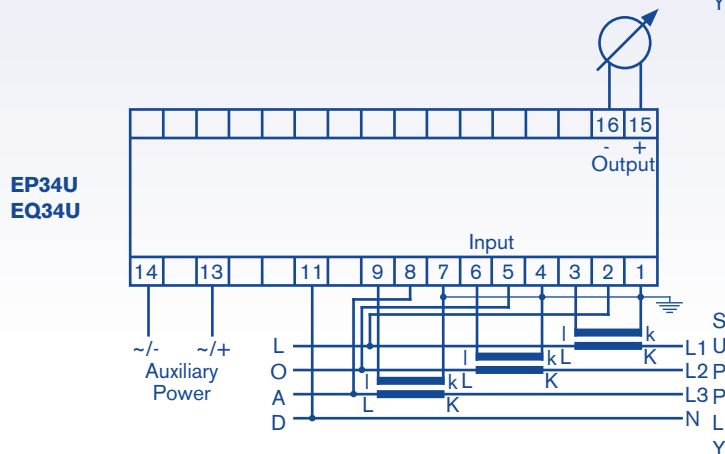
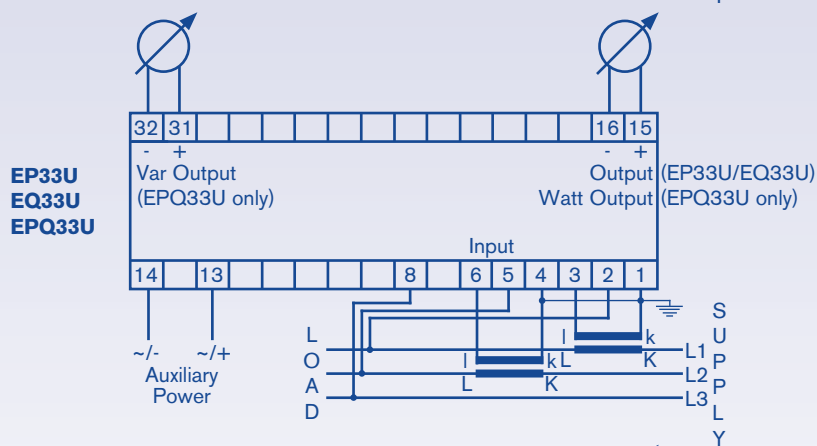
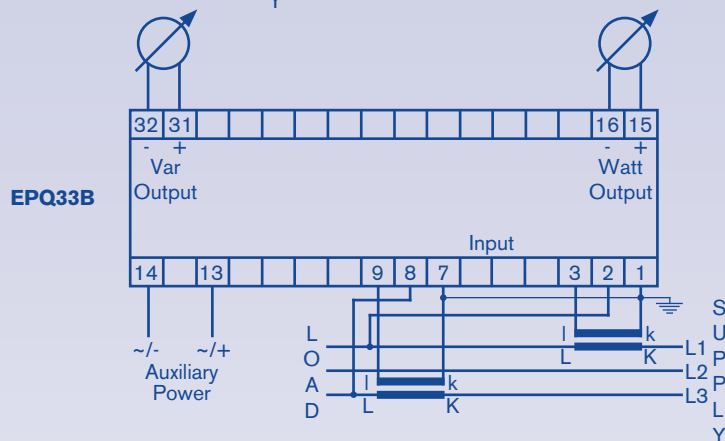
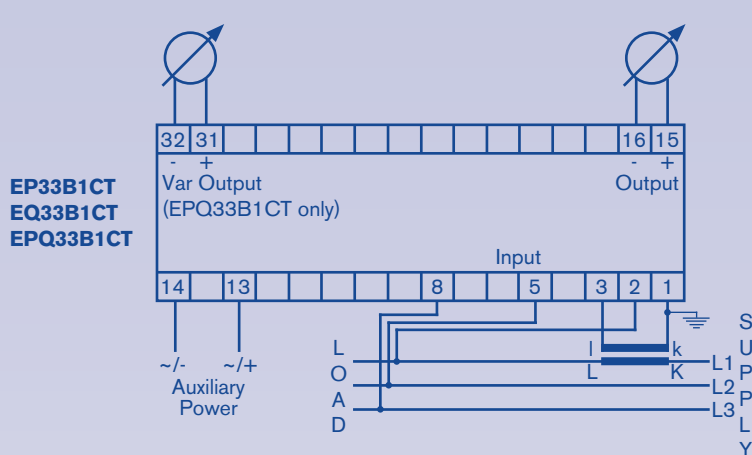
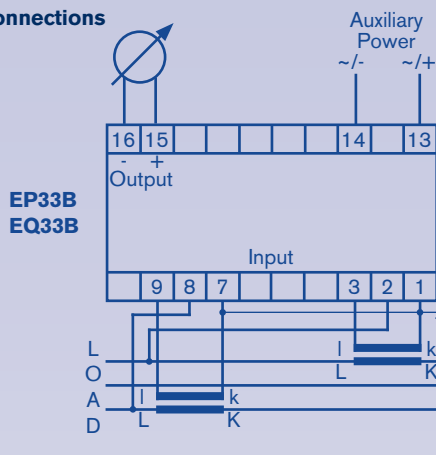
Weight:

- EP12B, EP33B, EP34B 700g
- EP33B1CT, EQ33B1CT 900g
- EP33U, EQ33U 900g
- EP34U, EQ34U, All EPQ 1000g

Connections

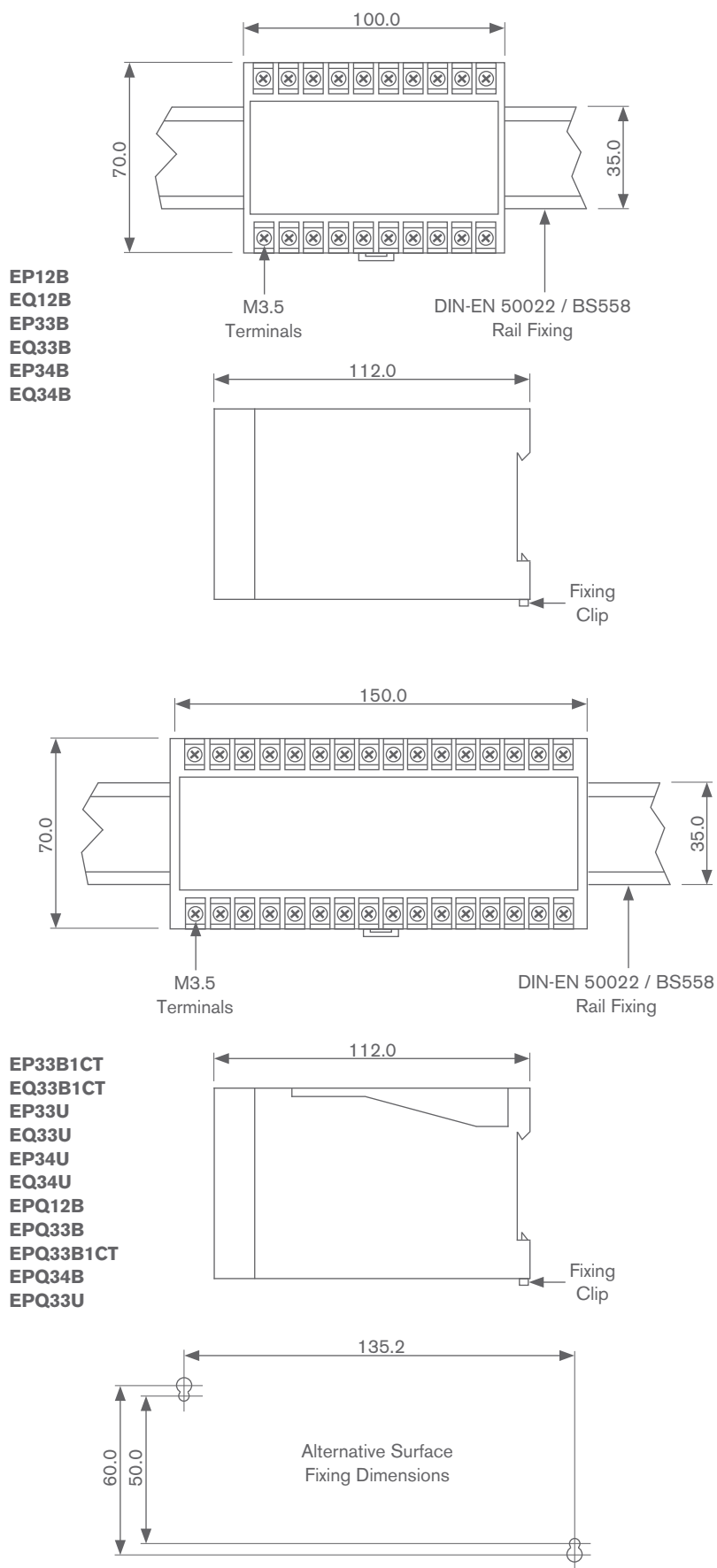


Connections



Product Features

- Isolated DC mA or DC voltage output
- Accuracy class 0.25
- Adjustable 'span' and 'zero'
- DIN rail mounting enclosure
- 4kV rms 50Hz 1 minute test isolation between input / output / case / auxiliary
- 1kVdc / 600Vac isolation between Watt & Var outputs on Watt/Var transducers
- Screw type terminals
- Fingerproof terminal cover included

Dimensions

All dimensions in mm

Ordering information

Model	Code	Description
	EP	Active Power (Watts)
	EQ	Reactive Power (Vars)
	EPQ	Active & Reactive Power (Watts & Vars)

Wiring System	Code	Description
	12B	Single Phase
	33B	3 Phase 3 Wire Balanced
	33B1CT	3 Phase 3 Wire Balanced (one CT connection)
	33U	3 Phase 3 Wire Unbalanced
	34B	3 Phase 4 Wire Balanced
	34U	3 Phase 4 Wire Unbalanced (EPQ N/A)

Input Voltage	Code	Description
	P1	110Vac ($\pm 20\%$ self power, 0-120% aux. power)
	P2	230Vac ($\pm 20\%$ self power, 0-120% aux. power)
	P3	415Vac ($\pm 20\%$ self power, 0-120% aux. power)
	PX	50 to 550Vac (specify)

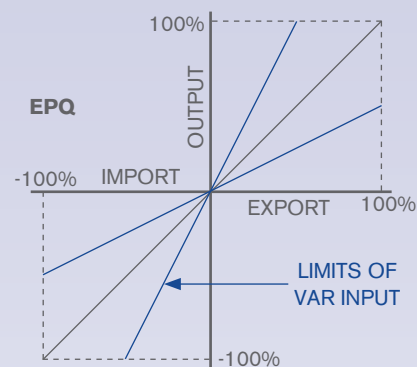
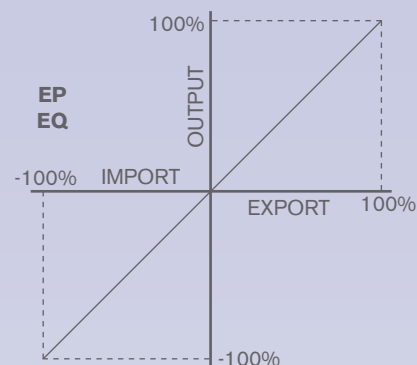
Input Current	Code	Description
	C1	1 Amp
	C5	5 Amp
	CX	0.5 to 7.5 Amps (specify)

Auxiliary Power	Code	Description
	E0	Self Powered
	E1	110Vac ($\pm 20\%$)
	E2	230Vac ($\pm 20\%$)
	E3	415Vac ($\pm 20\%$)
	E4	63.5Vac ($\pm 20\%$)
	E5	24Vdc ($\pm 20\%$)
	E6	48Vdc ($\pm 20\%$)
	E7	110Vdc ($\pm 20\%$)
	E10	220Vdc ($\pm 20\%$)

Output	Code	Description
	X1	$\pm 1\text{mA}$
	X2.5	$\pm 2.5\text{mA}$
	X5	$\pm 5\text{mA}$
	X10	$\pm 10\text{mA}$
	X10B	0-5-10mA
	X20	$\pm 20\text{mA}$
	XA	4-20mA
	XB	4-12-20mA
	XV	\pm Voltage (specify up to 15Vdc)

Input Frequency	Code	Description
	F50	50Hz
	F60	60Hz

Example **EPQ - 33B - P1 - C5 - E1 - XA - F50**

Function Graphs

On EPQ combined Watt & Var transducers the full scale Var input can be specified between 50% and 200% of the full scale Watt input.

e.g. If full scale Watt input is 200Watts, the Var input can be specified anywhere between 100 and 400Vars.

Input Voltage & Current	Full Scale Watts and/or Vars	12B Single Phase	33B/33U 3 Phase 3 Wire	34B/34U 3 Phase 4 Wire
110V & 1A (P1-C1)	Standard On Request	100 50 to 200	200 100 to 400	300 150 to 600
110V & 5A (P1-C5)	Standard On Request	500 250 to 1000	1000 500 to 2000	1500 750 to 3000
230V & 1A (P2-C1)	Standard On Request	200 100 to 400	400 200 to 800	600 300 to 1200
230V & 5A (P2-C5)	Standard On Request	1000 500 to 2000	2000 1000 to 4000	3000 1500 to 6000
415V & 1A (P3-C1)	Standard On Request	400 200 to 800	800 400 to 1600	1200 600 to 2400
415V & 5A (P3-C5)	Standard On Request	2000 1000 to 4000	4000 2000 to 8000	6000 3000 to 12000

General Specification

Output

Response Time:	< 400ms for 0-90% of input value
Warm Up Time:	< 15 minutes
Residual Output Ripple:	< 1% peak full scale
Long Term Drift:	±0.25% per year non-cumulative
Maximum Load:	1mA < 10kohm 2.5mA < 6kohm 5mA < 3kohm 10mA < 1.5kohm 20mA < 750ohm Voltage output >1kohm
Self powered voltage and current transducers have an adjustable span while all other units have an adjustable zero and span accessible from the front panel.	

Auxiliary

AC:	110 / 230 / 415V (±20%) (others upon request)
DC:	24 / 48 / 110V (±20%)

Environmental

Operating Temperature:	-20°C to 65°C
Storage Temperature:	-40°C to 75°C
Variation With Temperature:	0.03%/°C (±0.5% maximum)
Relative Humidity:	0 - 95% non-condensing

Burden

Input Circuits:	See individual specifications
Auxiliary Power Supply:	7VA combined Watt/Var transducers (4VA all other transducers)

EMC Compliance

Directive 89/336/EEC:	Electrostatic discharge IEC801.2 (8kV) Electromagnetic fields IEC801.3 level 3 Fast transient bursts IEC801.4 level 4 Surge withstand IEC255-5
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Enclosure

Enclosure:	Grey ABS plastic with finger proof terminal covers
Enclosure Code:	Case IP50, terminals IP10 to IEC529 and BS5490
Test Isolation:	4kV rms 50Hz 1min (to IEC 414) between input / output / case / AC auxiliary (2kV rms 50Hz 1 min for EK energy transducers) 1kVdc / 600Vac between Watt & Var outputs (EPQ units)
Continuous Operation Isolation:	800V rms 50Hz / 1kVdc between input / output / case / AC auxiliary 150Vdc output / DC auxiliary
Mounting:	35mm DIN rail (DIN-EN 50022)
Markings:	CE marked

Specification subject to change without notice.

Options

Non Standard Calibration

All transducers are supplied calibrated to standard input values as detailed in the individual specifications, however non-standard calibration input values can be specified (subject to technical viability).

Wide Output Adjust Switch on Power Transducers

All power transducers are available with a ten position switch accessible from the front panel which provides coarse adjustment of the output signal between 50% and 200% of the nominal.

Calibration Certificate

Calibration certificates traceable to national standards can be supplied on all transducers.

Conformal Coating

A conformal coating can be applied to the transducer circuitry during manufacture for transducers that will be operating in harsh environmental conditions.