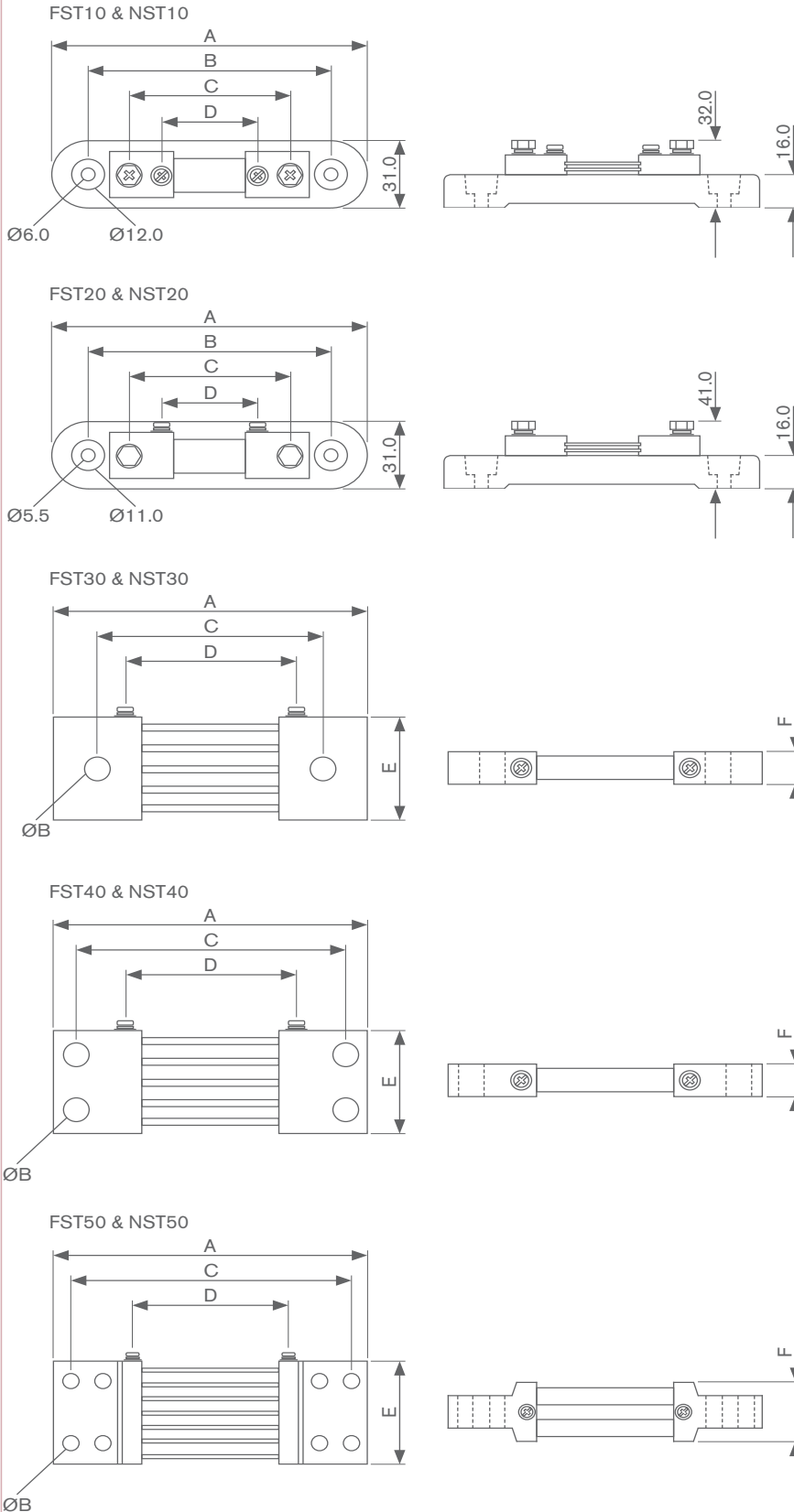


## Dimensions



### Range Data

Model	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	Weight (kg)
FST10-10	136	110	74	43	-	-	0.16
FST10-15	136	110	74	43	-	-	0.16
FST10-20	136	110	74	43	-	-	0.16
FST10-25	136	110	74	43	-	-	0.16
FST10-30	136	110	74	43	-	-	0.16
FST10-40	136	110	74	43	-	-	0.16
FST10-50	136	110	74	43	-	-	0.16
FST10-60	136	110	74	43	-	-	0.16
FST10-80	136	110	74	43	-	-	0.16
FST10-100	136	110	74	43	-	-	0.16
FST10-150	136	110	74	43	-	-	0.16
FST20-200	136	110	74	51	-	-	0.26
FST30-250	115	10.0	88	64	41	12	0.32
FST30-300	116	12.5	88	64	35	20	0.44
FST30-400	116	12.5	86	64	44	20	0.54
FST30-500	116	12.5	88	64	55	20	0.68
FST30-600	125	12.5	90	64	60	20	0.85
FST40-800	125	12.5	90	64	70	20	0.95
FST40-1000	160	12.5	120	64	70	20	1.45

NST10-10	136	110	74	43	-	-	0.16
NST10-15	136	110	74	43	-	-	0.16
NST10-20	136	110	74	43	-	-	0.16
NST10-25	136	110	74	43	-	-	0.16
NST10-30	136	110	74	43	-	-	0.16
NST10-40	136	110	74	43	-	-	0.16
NST10-50	136	110	74	43	-	-	0.16
NST10-60	136	110	74	43	-	-	0.16
NST10-80	136	110	74	43	-	-	0.16
NST10-100	136	110	74	43	-	-	0.16
NST10-150	136	110	74	43	-	-	0.16
NST20-200	136	110	74	51	-	-	0.26
NST30-250	115	10.0	88	64	41	12	0.32
NST30-300	116	12.5	88	64	35	20	0.44
NST30-400	116	12.5	86	64	44	20	0.54
NST30-500	116	12.5	88	64	55	20	0.68
NST30-600	125	12.5	90	64	60	20	0.85
NST40-800	125	12.5	90	64	70	20	0.95
NST40-1000	160	12.5	120	64	70	20	1.45
NST40-1200	160	12.5	120	64	85	20	1.90
NST40-1500	160	12.5	120	64	100	20	2.10
NST50-2000	230	12.5	205	65	103	50	4.80
NST50-2500	191	13.5	167	56	103	38	5.00
NST50-3000	280	15.0	238	65	103	64	6.90
NST50-4000	292	17.0	253	65	110	82	9.50
NST50-5000	315	17.0	271	65	128	106	15.6

All dimensions in mm

# Electrical Measurement Transducers



Global Suppliers of Measurement and Protection Equipment for Industry



## 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

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:	±0.5% 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
Isolation:	4kV rms 50Hz 1 min (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)
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.



## AC Current Transducers

### Models Available

- ECCC** Self Powered Zero Based Output
- ECCP** Auxiliary Powered Live Zero Output
- ECCR** Auxiliary Powered True RMS
- ECCB** Auxiliary Powered Bi-Polar Output

### 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 isolation between input / output / case / auxiliary
- Screw type terminals
- Fingerproof terminal cover included

AC current transducers measure AC current either directly or through a current transformer. The transducer converts the AC current signal to either a DC mA or DC voltage output which is directly proportional to the input signal value. The ECCC and ECCP are average sensing rms calibrated while the ECCR is a true rms sensing, rms calibrated transducer typically used for measuring distorted waveforms. The ECCB measures the magnitude and direction of the input current for use when monitoring import/export of branch currents in supply loops.

The ECCC transducers are self powered whilst all other AC current transducers are 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.

## For converting AC current 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 Current, $I_n$ :

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

#### Overload:

- $2 \times I_n$  continuous
- $30 \times I_n$  for 1 second

#### Working Range:

- 0 -  $120\% I_n$  (auxiliary powered)
- 10 -  $120\% I_n$  (self powered)

#### Frequency:

- 50 or 60Hz
- ECCR 40 to 500Hz

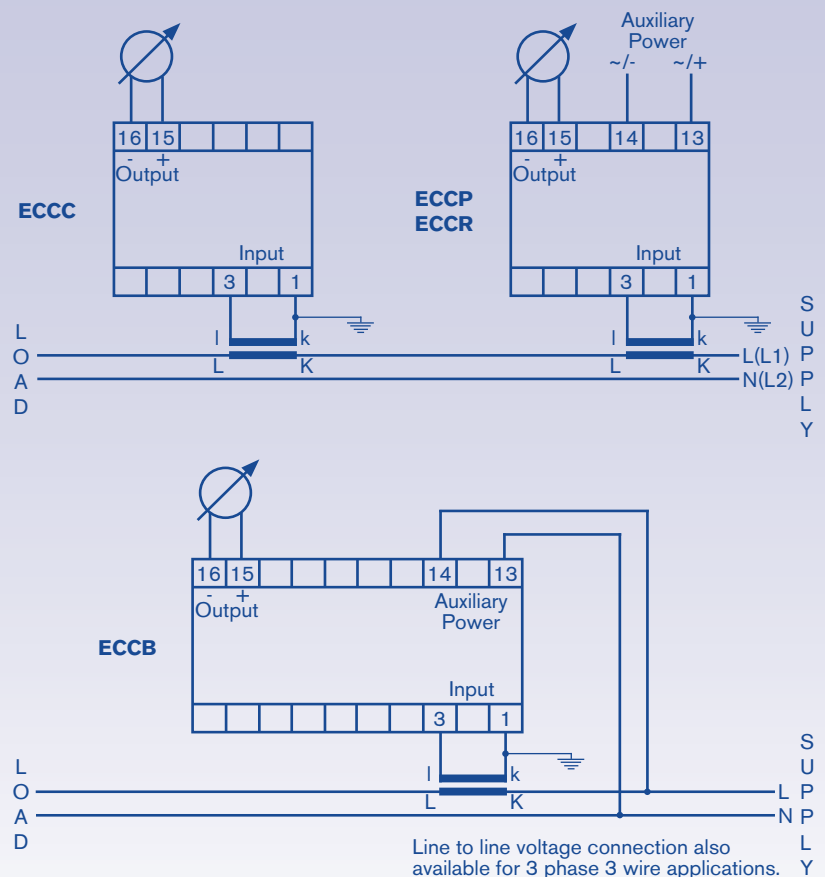
#### Burden:

- $< 0.3VA$  (auxiliary powered)
- $< 3VA$  (self powered)

#### Weight:

- ECCC 350g
- ECCP, ECCR, ECCB 600g

### Connections



## Ordering information

Model	Code	Description
	ECCC	Self Powered - Zero Based Output
	ECCP	Auxiliary Powered - Live Zero Output
	ECCR	Auxiliary Powered - True RMS
	ECCB	Auxiliary Powered - Bi-Polar Output

Input Current	Code	Description
	C1	1 Amp
	C5	5 Amp
	CX	0.7 to 7.5 Amps (specify)

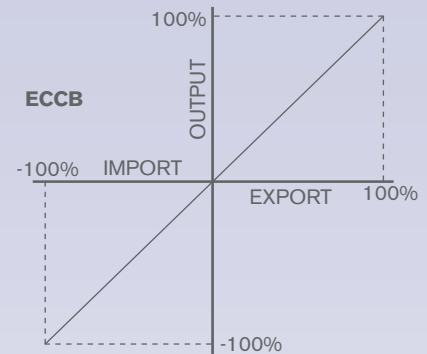
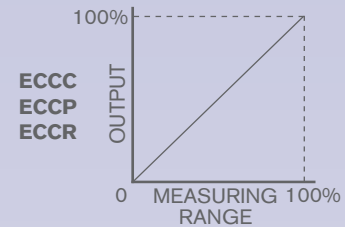
Auxiliary Power	Code	Description
	E0	Self Powered (ECCC only)
	E1	110Vac ( $\pm 20\%$ )
	E2	230Vac ( $\pm 20\%$ )
	E3	415Vac ( $\pm 20\%$ )
	E4	63.5Vac ( $\pm 20\%$ )
	E5	24Vdc ( $\pm 20\%$ )
	E6	48Vdc ( $\pm 20\%$ )
	E7	110Vdc ( $\pm 20\%$ )

Output	Code	Description
	X1	0-1mA $\pm 1$ mA (ECCB)
	X2.5	0-2.5mA $\pm 2.5$ mA (ECCB)
	X5	0-5mA $\pm 5$ mA (ECCB)
	X10	0-10mA $\pm 10$ mA (ECCB)
	X20	0-20mA $\pm 20$ mA (ECCB)
	XA	4-20mA N/A (ECCB)
	XV	Voltage $\pm$ Voltage (ECCB) (specify up to 15Vdc)

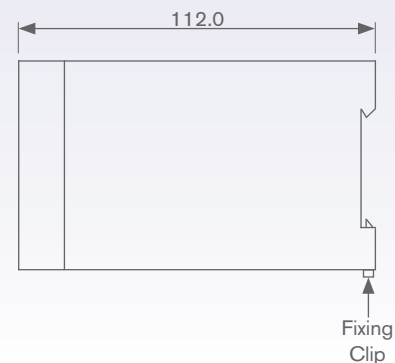
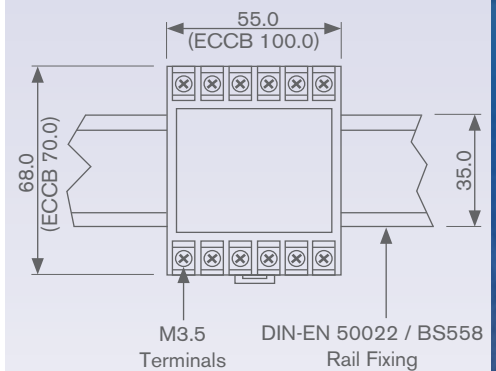
Input Frequency	Code	Description
	F50	50Hz
	F60	60Hz

**Example**                    **ECCP - C5 - E1 - XA - F50**

### Function Graphs



### Dimensions



All dimensions in mm



## AC Voltage Transducers

### Models Available

- EVCC** Self Powered Zero Based Output
- EVCP** Auxiliary Powered Live Zero Output
- EVCX** Self Powered Expanded Scale
- EVXP** Auxiliary Powered Expanded Scale
- EVCR** Auxiliary Powered True RMS
- EVXR** Auxiliary Powered True RMS Expanded Scale

### 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 isolation between input / output / case / auxiliary
- Screw type terminals
- Fingerproof terminal cover included

AC voltage transducers measure AC voltage either directly or through a voltage transformer. The transducer converts the AC voltage signal to either a DC mA or DC voltage output which is directly proportional to the input signal value. The EVCC and EVCP are average sensing rms calibrated while the EVCR is a true rms sensing, rms calibrated transducer typically used for measuring distorted waveforms.

The EVCX, EVXP and EVXR are designed to monitor the deviation of a voltage over a narrow band around the specified nominal voltage. The EVCC and EVCX transducers are self powered whilst all other AC voltage transducers are 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.

## For converting AC voltage 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

#### Overload:

- 1.2 x  $U_n$  continuous
- 1.5 x  $U_n$  for 1 second

#### Working Range:

- 0 - 120%  $U_n$  (auxiliary powered)
- 10 - 120%  $U_n$  (self powered)

#### Frequency:

- 50 or 60Hz
- EVCR / EVXR 40 to 500Hz

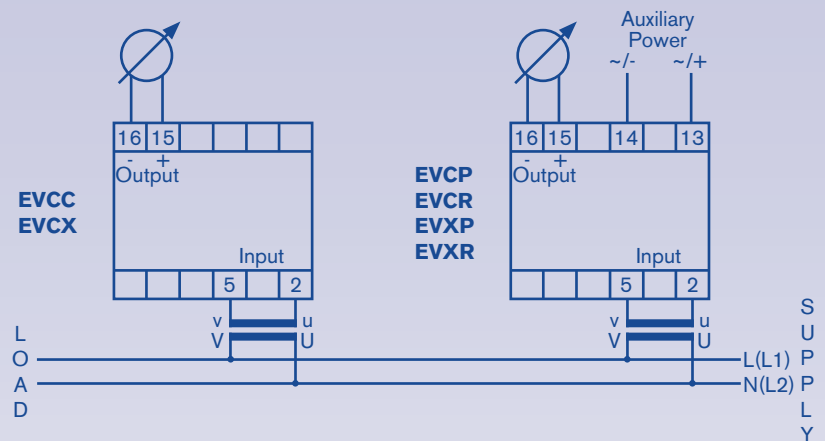
#### Burden:

- < 0.2VA (auxiliary powered)
- < 3VA (self powered)

#### Weight:

- EVCC, EVCX 350g
- EVCP, EVCR, EVXP, EVXR 600g

### Connections





## Ordering information

Model	Code	Description
	EVCC	Self Powered - Zero Based Output
	EVCP	Auxiliary Powered - Live Zero Output
	EVCX	Self Powered - Expanded Scale
	EVXP	Auxiliary Powered - Expanded Scale
	EVCR	Auxiliary Powered - True RMS
	EVXR	Auxiliary Powered - True RMS Expanded Scale

Input Voltage	Code	Description
	P1	110, 115 or 120Vac (specify)
	P2	220, 230 or 240Vac (specify)
	P3	380, 400, 415 or 440Vac (specify)
	PX	50 to 550Vac (specify)

Input Deviation/Range	Code	Description
	-	N/A (EVCC, EVCP and EVCR)
	D15	±15% (EVCX)
	D20	±20% (EVCX) 20% (EVXP, EVXR)
	DX	20% to 100% (EVXP, EVXR - specify)

Auxiliary Power	Code	Description
	E0	Self Powered (EVCC only)
	E1	110Vac (±20%)
	E2	230Vac (±20%)
	E3	415Vac (±20%)
	E4	63.5Vac (±20%)
	E5	24Vdc (±20%)
	E6	48Vdc (±20%)
	E7	110Vdc (±20%)

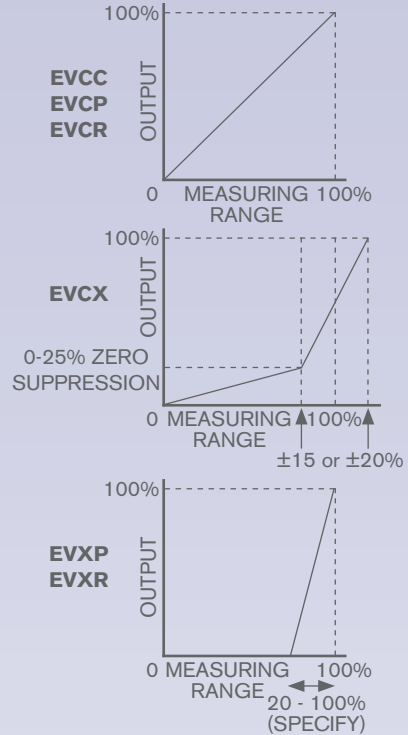
Output	Code	Description
	X1	0-1mA (not EVCX)
	X2.5	0-2.5mA
	X5	0-5mA
	X10	0-10mA
	X20	0-20mA
	XA	4-20mA
	XV	Voltage (specify up to 15Vdc)

EVCX Zero Suppression	Code	Description
	SZ	Upto 25% (specify)
	S0	True Zero

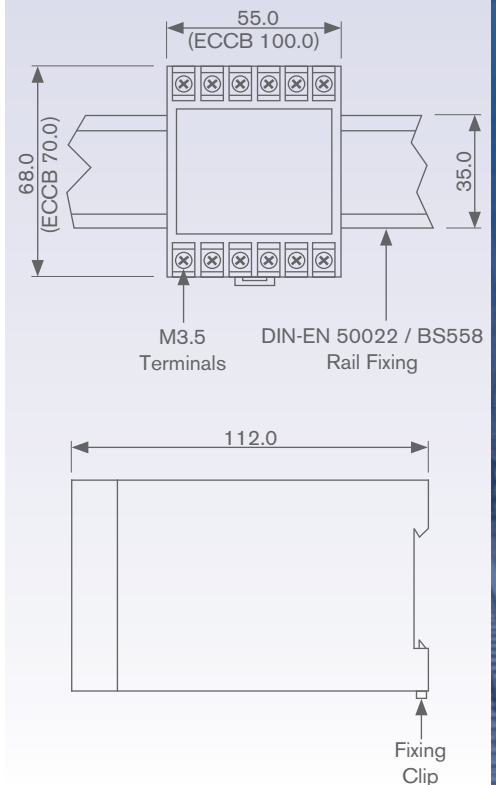
Input Frequency	Code	Description
	F50	50Hz
	F60	60Hz

**Example** EVXR - P1(110V) - D20 - E1 - XA - SZ - F50

### Function Graphs



### Dimensions



All dimensions in mm

## Power (Watts & Vars)

### Models Available

- EP12B** Single Phase Watts
- EP33B** 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
- 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
- EPQ33U** 3 Phase 3 Wire Unbal. Watts & Vars
- EPQ34B** 3 Phase 4 Wire Bal. Watts & Vars

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.

## 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 x  $U_n$ , 2 x  $I_n$  continuous
- 1.5 x  $U_n$ , 30 x  $I_n$  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

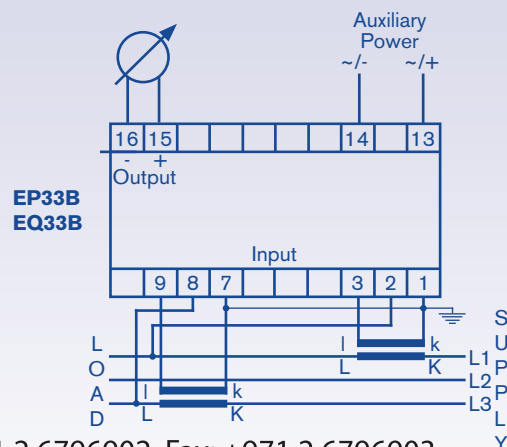
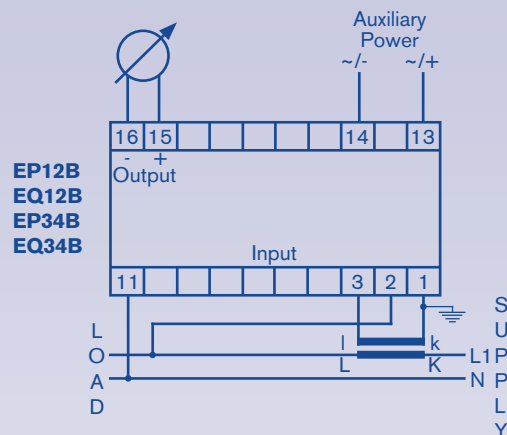
#### Burden:

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

#### Weight:

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

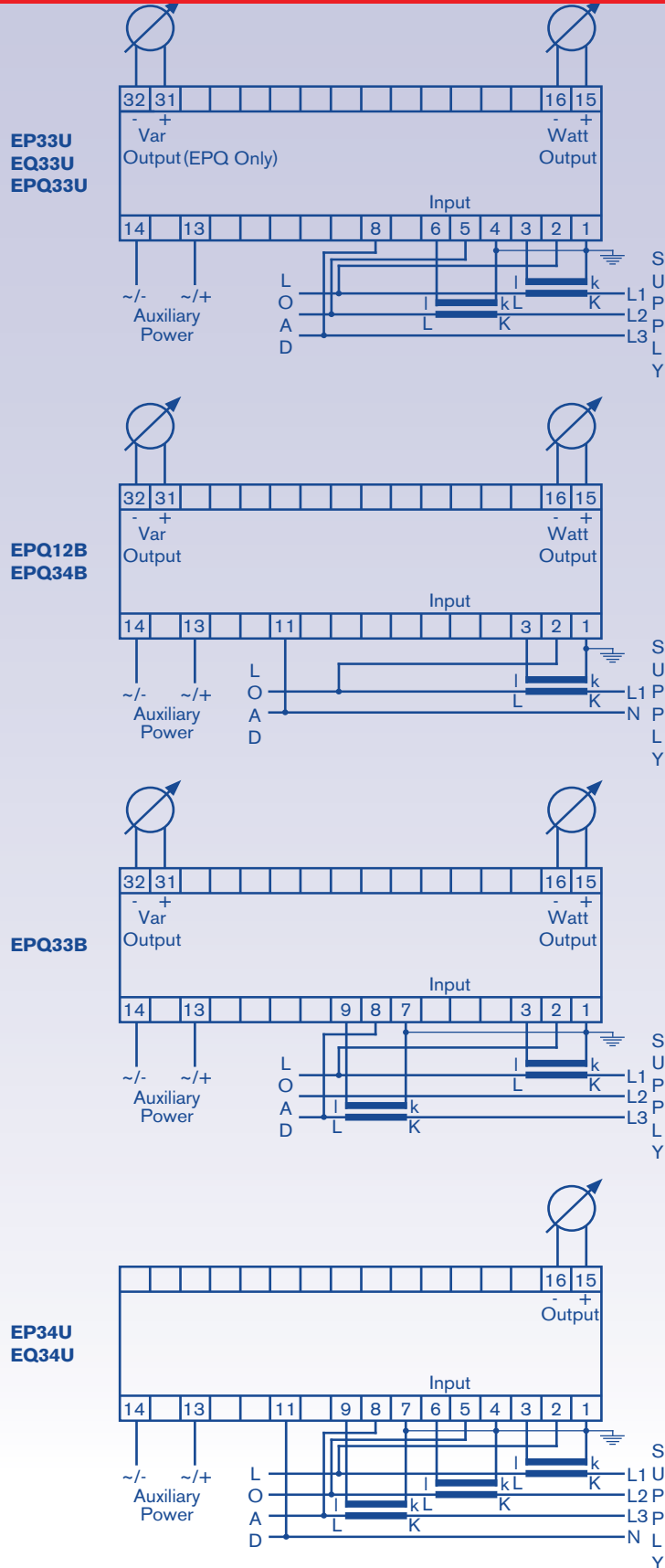
### Connections





## Connections

### Connections

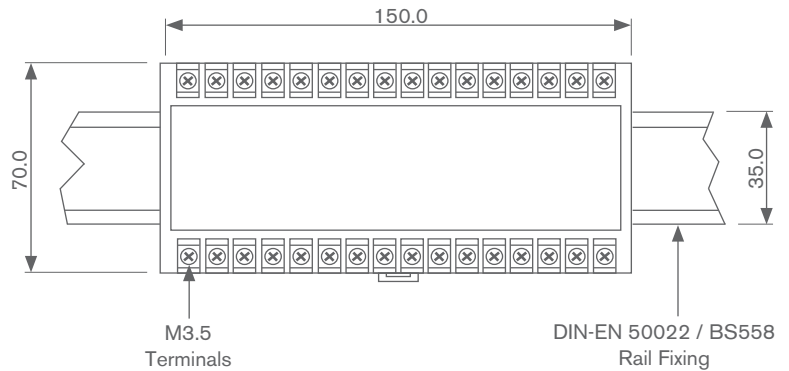
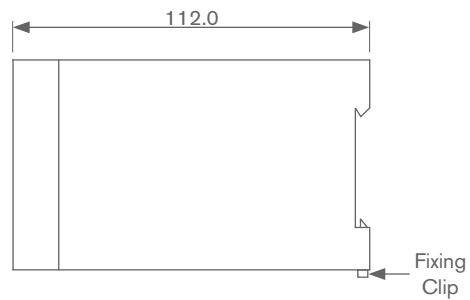
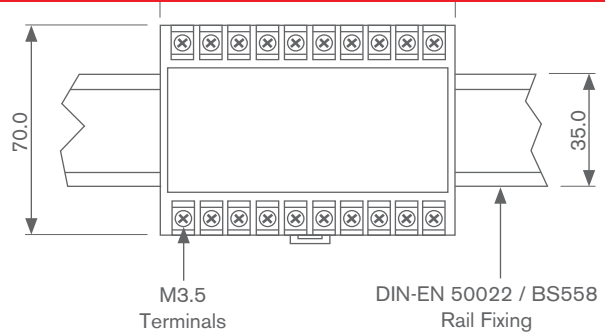


## Dimensions

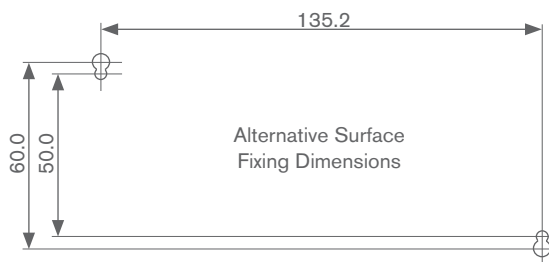
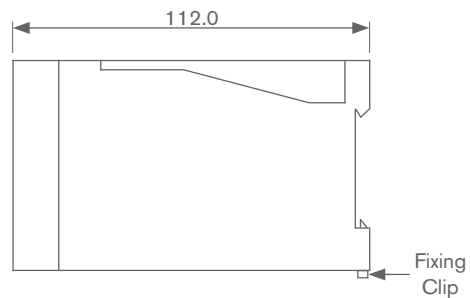
### Product Features

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

EP12B  
EQ12B  
EP33B  
EQ33B  
EP34B  
EQ34B



EP33U  
EQ33U  
EP34U  
EQ34U  
EPQ12B  
EPQ33B  
EPQ34B  
EPQ33U



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
	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 ( $\pm 20\%$ )

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

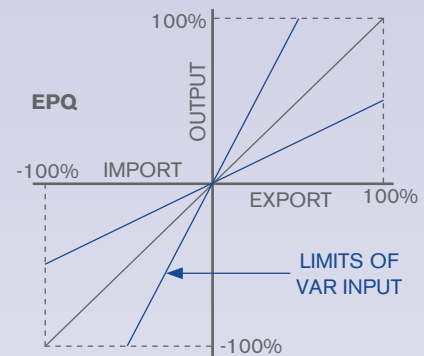
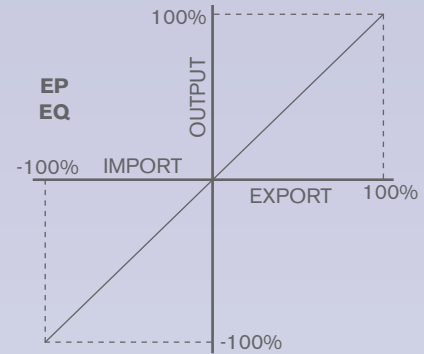
  

Input Frequency	Code	Description
	F50	50Hz
	F60	60Hz

Example	Code	Description
	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



## Energy (kWh) Transducers

### Models Available

- EK12B** Single Phase
- EK33B** 3 Phase 3 Wire Balanced
- EK33U** 3 Phase 3 Wire Unbalanced
- EK34B** 3 Phase 4 Wire Balanced
- EK34U** 3 Phase 4 Wire Unbalanced
- EKDC** DC System

### Product Features

- Voltage free pulsed output
- Accuracy class 1
- DIN rail mounting enclosure
- 2kV rms 50Hz 1 minute isolation between input / output / case / (auxiliary)
- Screw type terminals
- Fingerproof terminal cover included

Energy transducers measure active energy (kWh) either directly or through a voltage and/or current transformers or DC shunt. The transducer converts the energy signal to a voltage free pulse output which is directly proportional to the input signal value.

Models are available for single phase and three phase, balanced and unbalanced systems as well as DC systems. AC models have a user selectable CT ratio through a rotary switch accessible from a removable cover on the transducer. All AC energy transducers are self powered whilst DC energy transducers are powered from a large choice of AC or DC auxiliary power options. The 2kV isolated output signal can then be fed to remote counters, data loggers, PLC's or building management systems.

## For converting energy (KWh) to a proportional voltage free pulsed output

### Specification

#### Reference Standard:

- IEC 688, BS 6253, VDE/VDI 2191

#### Accuracy:

- Class 1 ( $\pm 1\%$  of reading max. error)

#### Input Voltage, $U_n$ :

- 50V to 440V direct connected (specify)
- or VT operated

#### Input Current, $I_n$ :

- 0-0.7A to 0-5A 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:

- $80 - 120\% U_n$
- $0 - 120\% I_n$

#### Frequency:

- 50, 60Hz or DC

#### Burden:

- Current circuit  $< 0.1VA$  per phase
- Voltage circuit  $< 3VA$  per phase

#### Pulsed Output:

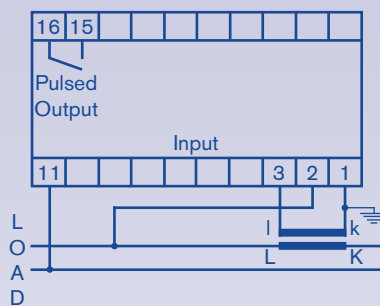
- Voltage free isolated relay
- 5A contacts at 250Vac, 200msec

#### Weight:

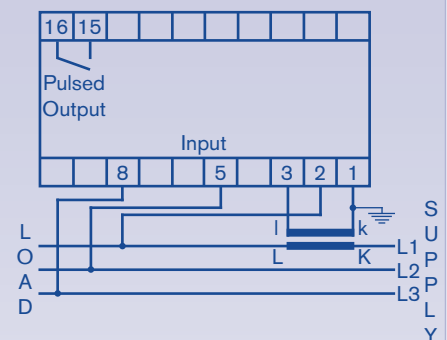
- EK12B, EK33B, EK34B 600g
- EK33U 700g
- EK34U 800g

### Connections

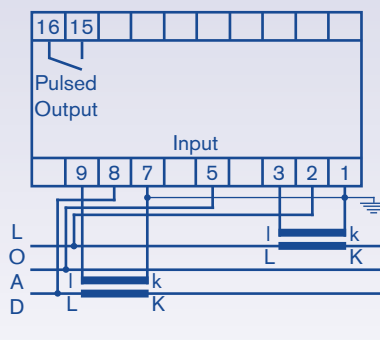
#### EK12B / EK34B



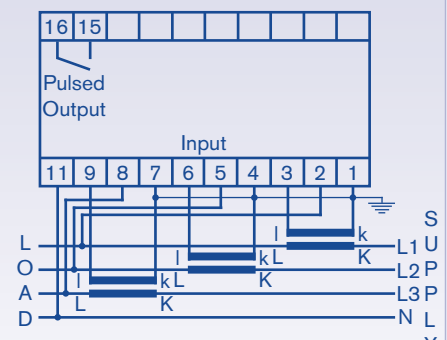
#### EK33B



#### EK33U



#### EK34U



## Ordering information

Model	Code	Description
	EK12B	Single Phase
	EK33B	3 Phase 3 Wire Balanced
	EK33U	3 Phase 3 Wire Unbalanced
	EK34B	3 Phase 4 Wire Balanced
	EK34U	3 Phase 4 Wire Unbalanced
	EKDC	DC System

Input Voltage	Code	Description
	P1	110Vac
	P2	230Vac
	P3	415Vac
	PX	50 to 440Vac (specify)
EKDC		12, 24, 48Vdc or upto 600Vdc upon request

Input Current	Code	Description
	C1L	25/1 to 800/1A (selectable) - see table below*
	C1H	200/1 to 6000/1A (selectable) - see table below**
	C5L	25/5 to 800/5A (selectable) - see table below*
	C5H	200/1 to 6000/1A (selectable) - see table below**
	C5X	Other CT ratio (specify)
	CX	0.7 to 7.5 Amps direct (specify)
EKDC		10 to 5000 Amps DC from 50, 60, 75mV shunt (specify)***

Auxiliary Power	Code	Description
	-	N/A (EK12B, EK33B, EK33U, EK34B, EK34U)
EKDC	E1	110Vac ( $\pm 20\%$ )
EKDC	E2	230Vac ( $\pm 20\%$ )
EKDC	E3	415Vac ( $\pm 20\%$ )
EKDC	E5	24Vdc (-10% to +20%)
EKDC	E6	48Vdc (-10% to +20%)
EKDC	E8	12Vdc (-10% to +20%)

Input Frequency	Code	Description
	F50	50Hz
	F60	60Hz
EKDC	FDC	DC

**Example** EK34U - P2 - C5L - F50

### Current Transformer Primary Currents (Selectable)

\* L 25, 40, 50, 60, 75, 80, 100, 120, 150, 200, 250, 300, 400, 500, 600, 800A

\*\*H 200, 250, 300, 400, 500, 600, 800, 1000, 1200, 1500, 1600, 2000, 2500, 3000, 4000, 6000A

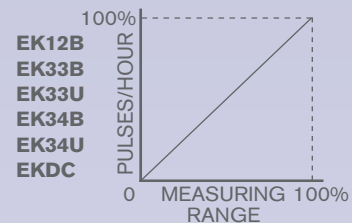
### \*\*\* Standard Shunt Values

10, 15, 20, 25, 30, 40, 50, 60, 75, 80, 100, 120, 150, 200, 250, 300, 400, 500, 600, 800, 1000, 1200, 1500, 2000, 2500, 3000, 4000, 5000A

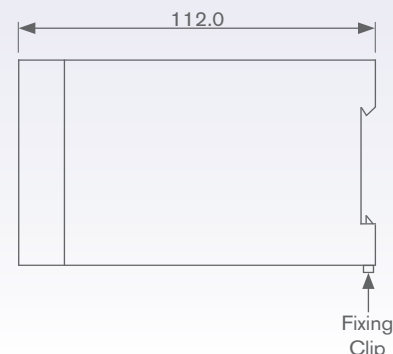
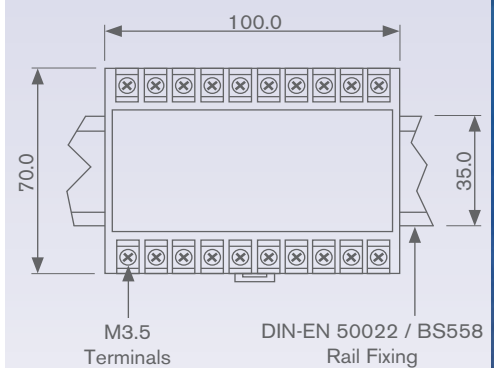
### Notes:

1. Models with (L)ow CT ratios will have a pulse rate of 1pulse/kWh and models with (H)igh CT ratios will have a pulse rate of 1pulse/10kWh (unless a VT ratio is applicable). Other pulse rates are available to suit direct connected units or VT ratios etc.
2. Ensure that current transformers are mounted such that K faces the supply and L faces the load.
3. Secondary windings of the current transformers should be earthed.

### Function Graph



### Dimensions



All dimensions in mm



## Phase Angle Transducers

### Models Available

- EA12B** Single Phase
- EA33B** 3 Phase Balanced
- EA12V** Voltage Synchronisation

### 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 isolation between input / output / case / (auxiliary)
- Screw type terminals
- Fingerproof terminal cover included

Phase angle transducers measure the phase relationship between a current and a voltage or two voltages. The transducer converts the phase angle value to either a DC mA or DC voltage output which is directly proportional to the input signal.

These can be used for monitoring and optimising power factor correction systems. All phase angle 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.

## For converting phase angle 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 down to 10% f.s.)

#### Input Voltage, $U_n$ :

- 0-50V to 0-550V direct connected
- 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 x  $U_n$ , 2 x  $I_n$  continuous
- 1.5 x  $U_n$ , 30 x  $I_n$  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

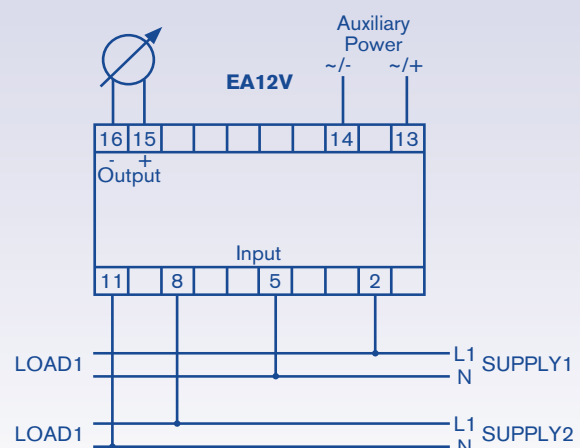
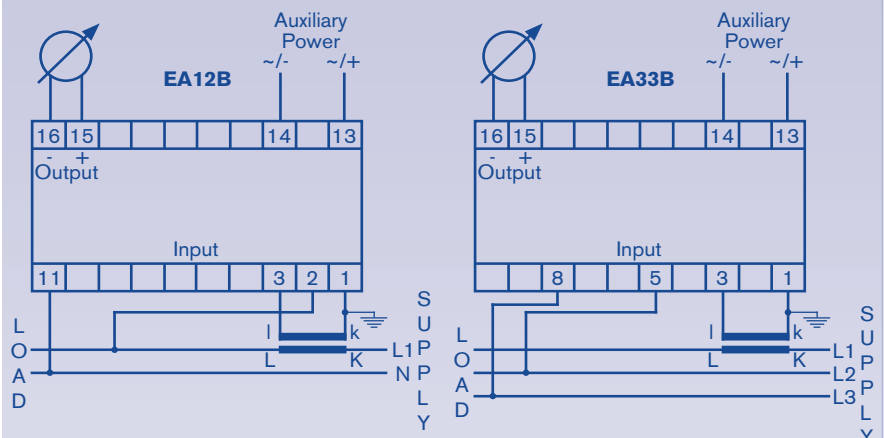
#### Burden:

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

#### Weight:

- EA12B, EA33B, EA12V 700g

### Connections





## Ordering information

Model	Code	Description
	EA12B	Single Phase
	EA33B	3 Phase Balanced
	EA12V	Voltage Synchronisation

Input Phase Angle	Code	Description
	60	$\pm 60^\circ$ (N/A for EA12V)
	90	$\pm 90^\circ$ (N/A for EA12V)
	180	$\pm 180^\circ$ (N/A for EA33B)

Input Voltage	Code	Description
	P1	110Vac
	P2	230Vac
	P3	415Vac
	PX	50 to 550Vac (specify)

Input Current	Code	Description
	C1	1 Amp
	C5	5 Amp
	CX	0.5 to 7.5 Amps direct (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 ( $\pm 20\%$ )

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

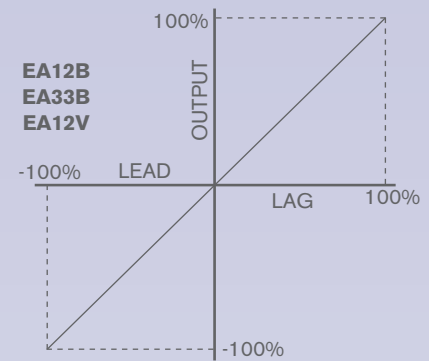
  

Input Frequency	Code	Description
	F50	50Hz
	F60	60Hz

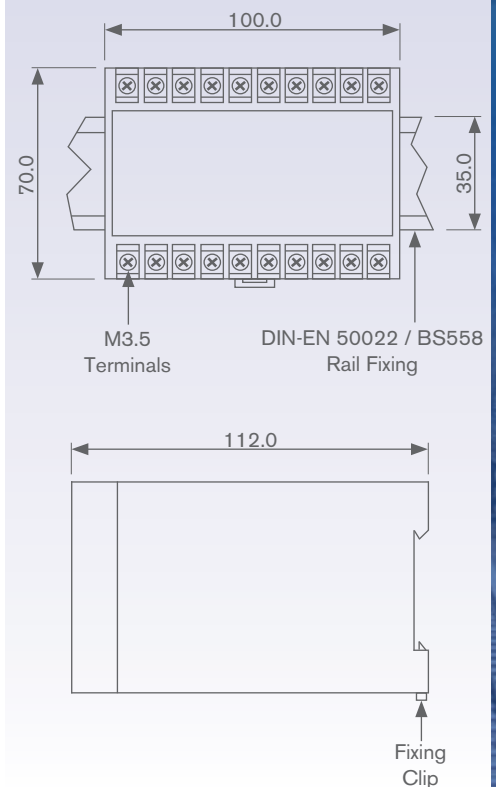
  

Example	EA33B - 60 - P1 - C5 - E1 - XB - F50
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### Function Graph



### Dimensions



All dimensions in mm



## Frequency Transducers

### Models Available

**EF12U** Self Powered Uni-polar Output

**EF12B** Self Powered Bi-Polar Output

### Product Features

- Isolated DC mA or DC voltage output
- Accurate to  $\pm 0.1\%$  of centre frequency
- Adjustable 'span' and 'zero'
- DIN rail mounting enclosure
- 4kV rms 50Hz 1 minute isolation between input / output / case / (auxiliary)
- Screw type terminals
- Fingerproof terminal cover included

Frequency transducers measure frequency either directly or through a voltage transformer. The transducer converts the AC frequency signal to either a DC mA or DC voltage output which is directly proportional to the input signal value.

The output is directly proportional to the frequency deviation around a specified nominal frequency. All frequency transducers are self powered.

The 4kV isolated output signals can then be fed to remote counters, data loggers, PLC's or building management systems.

## For converting frequency to a proportional DC mA or DC voltage output

### Specification

#### Reference Standard:

- IEC 688, BS 6253, VDE/VDI 2191

#### Accuracy:

- $\pm 0.1\%$  of centre frequency

#### Input Voltage, $U_n$ :

- 50V to 550V direct connected
- or VT operated

#### Overload:

- $1.2 \times U_n$  continuous
- $1.5 \times U_n$  for 1 second

#### Working Range:

- $80 - 120\% U_n$

#### Centre Frequency, $F_n$ :

- 44 to 65Hz
- 400Hz

#### Frequency Deviation:

- $\pm 1, 2, 3, 5$ Hz (centre 44 to 65Hz)
- $\pm 10, 20, 30, 40$ Hz (centre 400Hz)

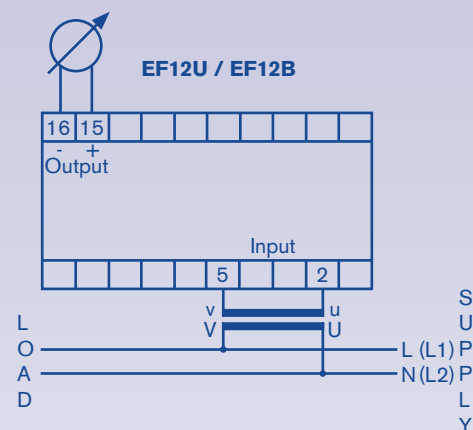
#### Burden:

- Voltage circuit  $< 3VA$

#### Weight:

- EF12U, EF12B 600g

### Connections



## Ordering information

Model	Code	Description
	EF12U	Self Powered - Uni-Polar Output
	EF12B	Self Powered - Bi-Polar Output

Input Voltage	Code	Description
	P1	110Vac
	P2	230Vac
	P3	415Vac
	PX	50 to 550Vac (specify)

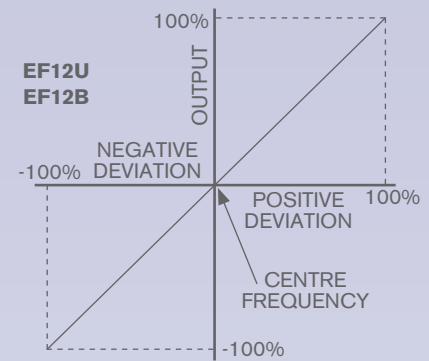
Output	Code	Description
	EF12U	EF12B
	X1	0-1mA $\pm 1$ mA
	X2.5	0-2.5mA $\pm 2.5$ mA
	X5	0-5mA $\pm 5$ mA
	X10	0-10mA $\pm 10$ mA
	X20	0-20mA $\pm 20$ mA
	XA	4-20mA     N/A
	XB	N/A          4-12-20mA
	XV	Voltage $\pm$ Voltage (specify up to 15Vdc)

Centre Frequency	Code	Description
	F50	50Hz
	F60	60Hz
	F400	400Hz
	FX	44 to 65Hz (specify)

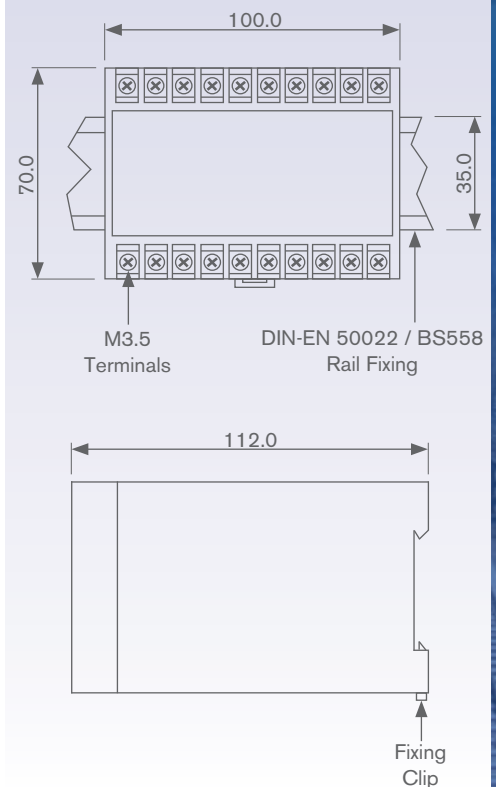
Frequency Deviation	Code	Description
	D1	$\pm 1$ Hz
	D2	$\pm 2$ Hz
	D3	$\pm 3$ Hz
	D5	$\pm 5$ Hz
	DX	$\pm 1$ to $\pm 8$ Hz (specify)
	DX	$\pm 10$ to $\pm 40$ Hz (F400 - specify)

**Example**                      **EF12U - P1- XA - F50 - D5**

### Function Graph



### Dimensions



All dimensions in mm



## DC Current & Voltage Transducers

### Models Available

**EDCC** Auxiliary Powered DC Current

**EDCV** Auxiliary Powered DC Voltage

### 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 isolation between input / output / case / auxiliary
- Screw type terminals
- Fingerproof terminal cover included

DC voltage transducers measure DC voltage directly and the DC current transducers measure DC currents up to 10 Amps directly. Higher currents can be measured using a shunt and a DC voltage transducer.

The transducers convert the DC voltage or current signal (or DC millivolt value from the shunt) to either a DC mA or DC voltage output which is directly proportional to the input signal value. All DC transducers are powered from a large choice of AC or DC auxiliary power options.

The DC transducers offer isolation between the DC input signal and the DC output which can be used to prevent earth loops. The 4kV isolated output signals can then be fed to analogue meters, digital meters, PLC's or building management systems.

## For converting DC signals 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 Current, $I_n$ :

- 0-1mA to 0-10A direct connected
- 50, 60, 75mV shunt operated

#### Input Voltage, $U_n$ :

- 0-20mV to 0-600V direct connected

#### 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 -  $120\% U_n$

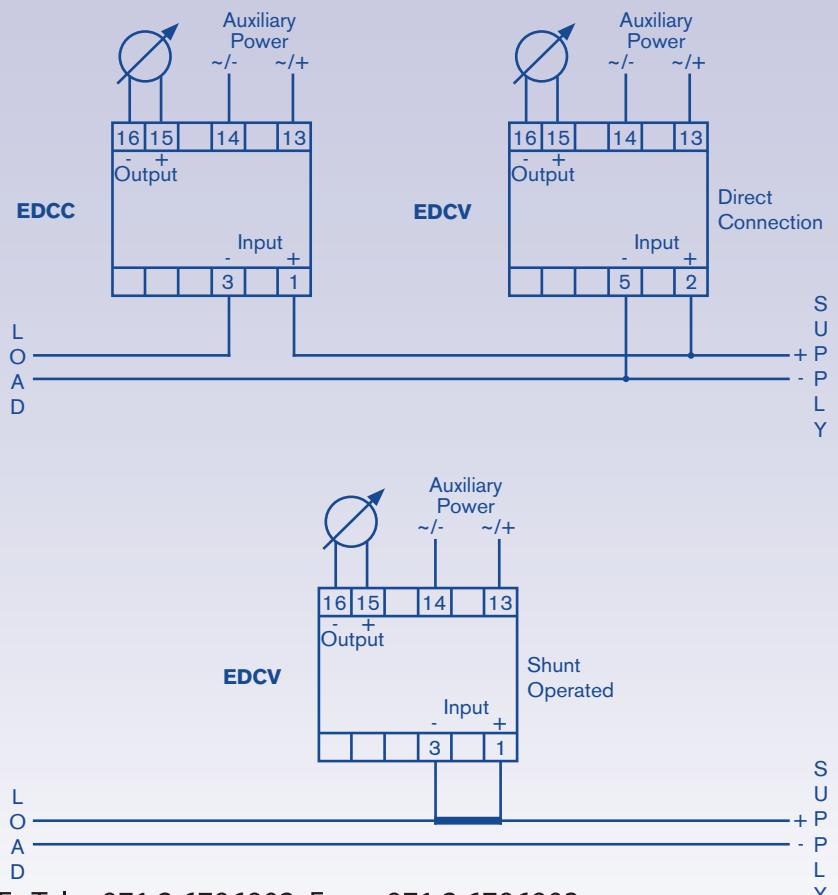
#### Burden:

- EDCC < 0.3VA
- EDCV < 0.2VA

#### Weight:

- EDCC, EDCV 600g

### Connections



## Ordering information

Model	Code	Description
	EDCC	Auxiliary Powered DC Current
	EDCV	Auxiliary Powered DC Voltage

Input Voltage/Current	Code	Description
	CX	$\pm 1\text{mA}$ to $\pm 10\text{A}$ (specify)
	CA	4-20mA
	VX	$\pm 20\text{mV}$ to $\pm 600\text{V}$ (specify)

Auxiliary Power	Code	Description
	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 ( $\pm 20\%$ )

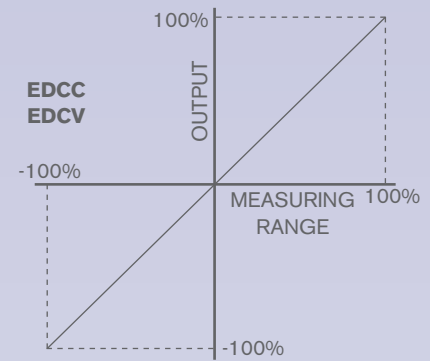
  

Output	Code	Description
	X1	$\pm 1\text{mA}$
	X2.5	$\pm 2.5\text{mA}$
	X5	$\pm 5\text{mA}$
	X10	$\pm 10\text{mA}$
	X20	$\pm 20\text{mA}$
	XA	4-20mA
	XB	4-12-20mA
	XV	$\pm$ Voltage (specify up to 15Vdc)

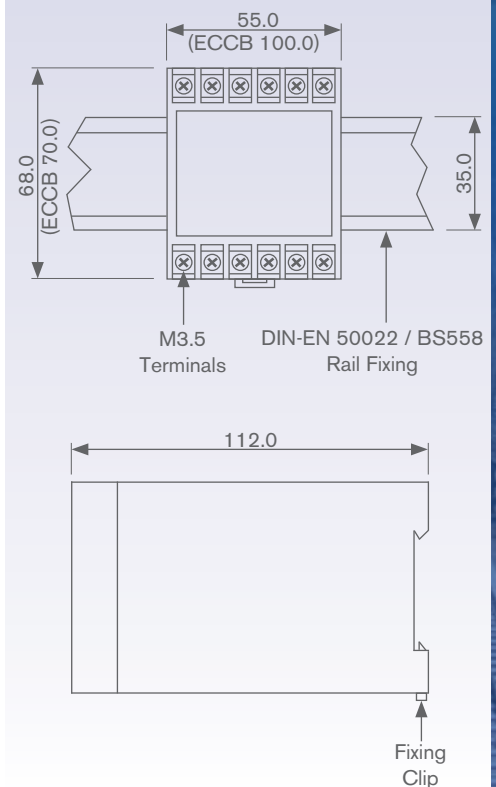
  

Example	EDCC - CX(5Adc) - E1 - XA
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### Function Graphs



### Dimensions



All dimensions in mm