

Robertshaw Energy Regulators and Thermostats

Robertshaw, an Invensys Controls brand, has been well known for producing reliable domestic and commercial appliance controls for many years. In particular Robertshaw has been renowned for producing excellent quality cooking controls for Ovens, Stoves, Grills and many other cooking appliances. The reliability and success of these products are evident in the continued use of appliances, fitted with Robertshaw controls, many years after their manufacture.

Naturally, appliances may need spare controls from time to time. Invensys Controls continue to have specifically designed replacement controls available to the aftermarket even if original models have been made obsolete. The following pages include details on available replacement control kits, as well as cross references and advice of models that are no longer replaceable.

Energy Regulators

Invensys and Robertshaw **Energy Regulators** are more commonly known as **Simmerstats**. They are generally used on electric cooking ranges, cooktops and grills to control an element. The **M-Series** energy regulators are the current models available in universal kits and some limited direct replacements. They also replace the **INFINITE** and **T-Series** models, which are no longer available. Following are some tables describing the models available and lists of energy regulators that can be replaced by the M-Series Models.

The M-Series Energy Regulator

Compact Design

Dimensions are 45mm x 38mm x 21mm. Terminals are located on the side instead of the back.

High Rating

M-Series rating is 240VAC 15A (Infinite is 12A)

Simple Installation

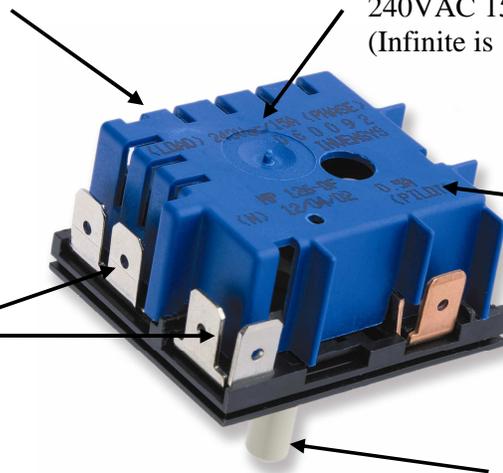
Terminals are named, not numbered

Convenience

Dual terminals on selected connections (not included on Infinites)

Adaptable

Also available with solid shafts as well as the universal



Invensys Replacement Energy Regulators

Part Number	Description	Specifications
M32314	Energy Regulator, Single Element, Double Pole. Detents Low at 45 Deg CW. Direct Replacement Solid Shaft 6mm Diam X 22mm Long.	240VAC, 15Amp
M55314	Energy Regulator, Single Element, with Phase Break. Detents Low at 45 Deg CW. Universal Shaft 3/16", 6mm or 1/4" Diam X 20mm or 22mm Long.	240VAC, 15Amp
M58314	Energy Regulator, Single Element, with Isolated Pilot. Detents Low at 45 Deg CW. Universal Shaft 3/16", 6mm or 1/4" Diam X 20mm or 22mm Long.	240VAC, 15Amp
M82314	Energy Regulator, Dual Element, with Phase Break. Detents Low at 30 Deg CW & CCW. Universal Shaft 3/16", 6mm or 1/4" Diam X 20mm or 22mm Long.	240VAC, 15Amp
M3V-102	Energy Regulator, Single Element, with Phase Break. Detents Low at 75 Deg CW. Universal Shaft 3/16", 6mm or 1/4" Diam X 20mm or 22mm Long.	240VAC, 15Amp
MD3-110	Energy Regulator, Dual Element, with Phase Break. Detents Low at 30 Deg CW & Hi at 30 Deg CCW. Universal Shaft 3/16", 6mm or 1/4" Diam X 20mm or 22mm Long	240VAC, 15Amp
MS4-217	Energy Regulator, Single Element, with Isolated Pilot. Detents Low at 45 Deg CW. Direct Replacement Solid Shaft 6mm Diam X 22mm Long.	240VAC, 15Amp

Invensys Energy Regulators Cross Reference

Use Part Number	In Place of Part Numbers
M32314	MPA 101, INF32314, INF-311-00, INF-313-02, INF-321-00, INF-321-01, INF-323-02, INF-323-03, INF-322-04, INF-323-06, INF-323-07, INF-323-09, INF-323-11, INF-323-12, INF-323-16
M55314	MP 101, MP 104, M3V-700, INF55314, INF-511-00, INF-513-02, INF-512-03, INF-513-04, INF-513-06, INF-513-07, INF-512-08, INF-513-09, INF-521-00, INF-523-02, INF-523-03, INF-523-04, INF-522-05, INF-523-06, INF-523-07, INF-522-08, INF-523-10, INF-523-11, INF-521-13, INF-543-02, INF-551-00, INF-554-01, INF-553-02, INF-553-03, INF-553-04, INF-552-05, INF-553-07, INF-552-08, INF-553-09, INF-552-11, INF-553-12, INF-553-13, INF-553-15, INF-551-16, INF-552-17, INF-571-00, INF-573-03, INF-573-04, INF-572-05, INF-572-06, INF-573-07, INF-572-08, INF-573-09, T1 201, T1 202, T1 203, T1 205, T1 208, T3V 700, T3 201, T3 203, T3 205, T4 201, T4 204, T4 205, T4 208, T5 201, T5 202, T5 203, T5 204, T5 205, T5 210, T5 215, T6 201, T6 205, T6 207, TP 201, TP 202, TP 205
M58314	MS 101, INF58314, MSV,600, INF-581-00, INF-582-01, INF-582-02, INF-583-03, INF-584-04, TS1 201, TS1 202, TS1 204, TS1 205, TS1 206, TS4 201, TS4 204, TS4 205, TSV 600

Invensys Energy Regulators Cross Reference (cont')

Use Part Number	In Place of Part Numbers
M82314	MDP 102, MDP 105, MD3V-800, INF82314, INF-813-02, INF-813-03, INF-812-04, INF-812-05, INF-821-00, INF-824-01, INF-823-02, INF-823-03, INF-823-04, INF-822-05, INF-822-06, INF-823-07, INF-822-08, INF-823-14, INF-823-09, INF-823-11, INF-823-12, INF-823-15, INF-823-16, INF-822-18, INF-823-19, TD2 101, TD3 101, TD3 102, TD3 103, TD3 201, TD3 203, TD3 205, TD5 101, TD5 202, TD5 203, TD5 204, TD5 205, TD5 207, TD6 101, TD6 102, TD6 103, TD6 203, TD6 205, TD6 207, TDP 101, TDP 102, TDP 103, TDP 104, TDP 201, TDP 202, TDP 205
M3V-102	T1 102, T1 103, T1 104, T2 102, T3 101, T3 102, T3V 102, T3 108, T4 101, T4 102, T4 105, T4 106, T5 101, T5 102, T6 101, T6 102, TP 101, TP 106
MD3-110	MDP 110
MS4-217	TS4 217

Notes:

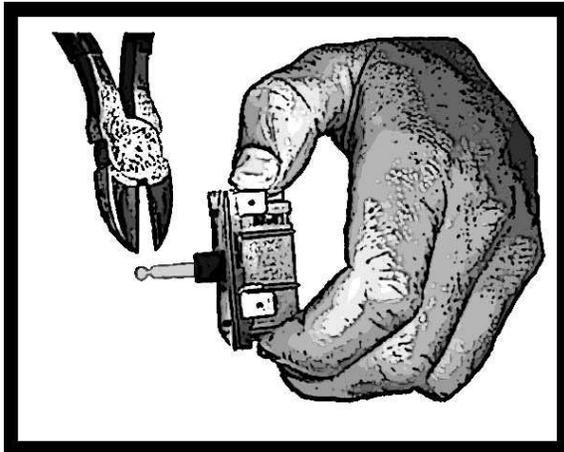
- T-Series and INFINITE Series are no longer available. Please use M-Series replacements as listed above.
- INF900, INFL, TL and TDL models are no longer available and have no possible replacements.
- Any T-Series or INF part numbers not listed above are no longer available and have no possible replacements.
- M-Series models can also replace Australian Controls Models KV and MH. Consult your local distributor for cross-reference details.
- M-Series part numbers not listed above require a direct replacement.
- All Universal Shaft models in the above table are supplied as *UniKits*. These include Neutral Lead, Instruction Sheet, Mounting Nut, Shaft Adaptors and Terminal Connectors. Solid Shaft models include Instruction Sheet and Mounting Nut. Instruction sheets include wiring information.

Important Notes on Energy Regulator Replacement

If the Energy Regulator being replaced has an earth wire attached to it, this earth wire may have been used to earth the panel it is mounted to. This M series control has no earth terminal requirement, but the panel may still need to be earthed. In this case the earth wire must be attached directly to the panel the control was mounted to.

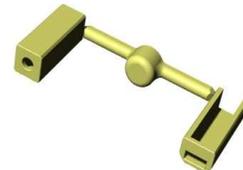
Replacement of controls should only be carried out by a qualified electrician or service technician.

If the control in this kit has a square steel shaft the following instructions apply:

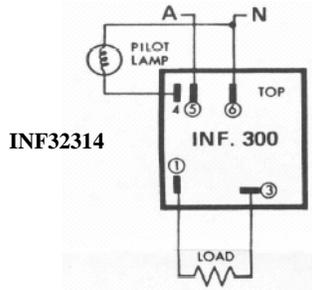


There are 3 standard shaft diameters, 3/16, 1/4 inch and 6mm. All are accounted for in this Kit. The square steel shaft with no adaptor fitted will replace 3/16 shafts. The adaptors depicted below fit over the shaft to convert it to 6mm or 1/4 inch.

There are two standard shaft lengths, the older 1-inch and the current 22mm. Both are accounted for. The shaft is 1 inch long, if 22mm is required then cut the shaft at the notched position as shown in the diagram above for 22mm.



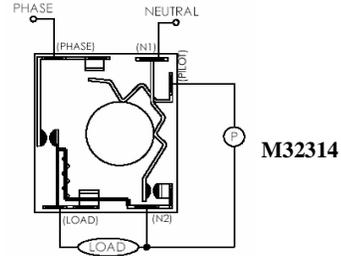
Wiring Diagrams (Includes Infinite Reference Guide)



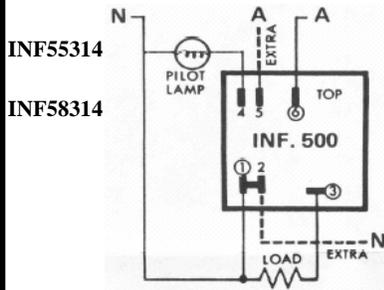
INF32314

INF32314 to M32314

- Terminal "1" equals "N2"
- Terminal "3" equals "LOAD"
- Terminal "4" equals "PILOT"
- Terminal "5" equals "PHASE"
- Terminal "6" equals "N1"



M32314

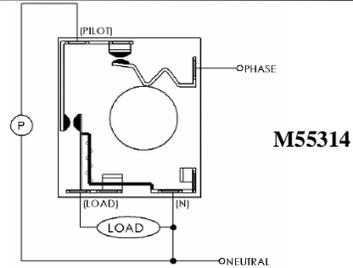


INF55314

INF58314

INF55314 to M55314

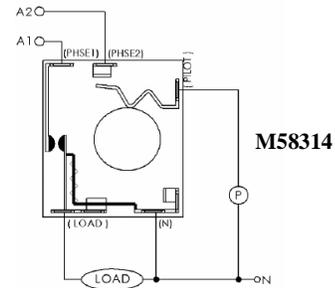
- Terminal "1" equals "N"
- Terminal "3" equals "LOAD"
- Terminal "4" equals "PILOT"
- Terminal "6" equals "PHASE"



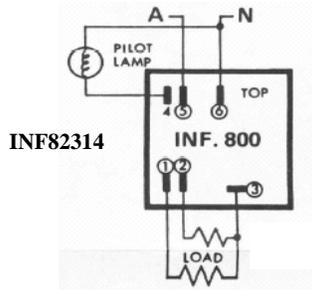
M55314

INF58314 to M58314

- Terminal "1" equals "N"
- Terminal "3" equals "LOAD"
- Terminal "4" equals "PILOT"
- Terminal "5" equals "PHASE2"
- Terminal "6" equals "PHASE1"



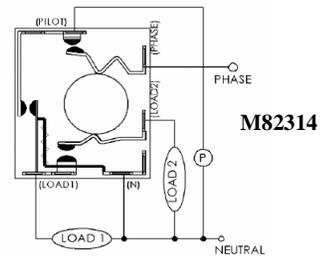
M58314



INF82314

INF82314 to M82314

- Terminal "1" equals "LOAD1"
- Terminal "2" equals "LOAD2"
- Terminal "3" equals "N"
- Terminal "4" equals "PILOT"
- Terminal "5" equals "PHASE"
- Terminal "6" equals "N"



M82314

Thermostats

Robertshaw EA Series thermostats are used for both domestic and commercial cooking and heating to control an electric element. EA3 models are generally used for domestic ovens and come in a single contact version. The EA3 models are available as universal kits only. EA5 models are used for commercial cooking and heating applications, generally for cooking appliances, and are available as direct replacements. Following are some tables describing the models available and lists of thermostats that can be replaced by these models.

Robertshaw Replacement Thermostats

Part Number	Description	Specifications
EA17700	Thermostat, Fryer, Single Contact, 95 - 205 deg C (310°.dial arc), 1/4" Diam X 20mm Shaft, 900mm Nickel Plated Capillary	0.2Amps 250VAC
EA3447	Thermostat, Oven, Single Contact, 70 - 290 deg C (270°.dial arc), Universal Shaft 3/16", 6mm or 1/4" Diam, 2250mm Capillary	240VAC 30Amp
EA5406	Thermostat, Oven, Single Contact, 70 - 290 deg C (310°.dial arc), 1/4" Diam X 20mm Shaft, 1800mm Capillary	240VAC 30Amp
EA5497	Thermostat, Oven, Single Contact, 70 - 290 deg C (310°.dial arc), 1/4" Diam X 20mm Shaft, 2250mm Nickel Plated Capillary	240VAC 30Amp
EA5607	Thermostat, Bain Marie, Single Contact, 15 - 120 deg C (310°.dial arc), 1/4" Diam X 20mm Shaft, 1800mm Nickel Plated Capillary	240VAC 30Amp
EA5701	Thermostat, Fryer, Single Contact, 95 - 205 deg C (310°.dial arc), 1/4" Diam X 20mm Shaft, 900mm Nickel Plated Capillary	240VAC 30Amp

Robertshaw Thermostat Cross Reference

Use Part Number	In Place of Part Numbers
EA17700	EA177007
EA3447	EA33002, EA33010, EA33037, EA33045, EA33053, EA33061, EA3307A, EA33088, EA33096, EA33109, EA33117, EA33125, EA33133, EA33141, EA3315, EA3316, EA34005, EA34013, EA34021, EA3403A, EA34152, EA34160, EA34179, EA34187, EA34208, EA34216, EA34224, EA34232, EA34240, EA34259, EA34267, EA34275, EA34283, EA34291, EA34304, EA34312, EA34320, EA34339, EA34347, EA34355, EA34363, EA34371, EA34380, EA34398, EA34400, EA34419, EA34427, EA34435, EA34443, EA3446A, EA34486, EA34507, EA34523, EA34558, EA34574, EA34582, EA34611, EA34638, EA34654, EA34662, EA34670, EA34689, EA34697, EA34700, EA34718, EA34734, EA34742, EA3475A, EA34806, EA34822, EA34830, EA34478
EA5406	EA54075, EA52037, EA54980, EA54067
EA5497	EA54008, EA54016, EA54024, EA54032, EA54040, EA54059, EA54083, EA54091, EA54104, EA54112, EA54120, EA54139, EA54147, EA5415 , EA54200, EA54243, EA54261, EA54278, EA54307, EA54462, EA54921, EA54930, EA54948, EA54956, EA59001, EA59046, EA59087, EA59095, EA59116, EA59124, EA54972

Robertshaw Thermostat Cross Reference (cont')

Use Part Number	In Place of Part Numbers
EA5607	EA36000, EA36035, EA36043, EA36051, EA36060, EA36078, EA36086, EA36094, EA3610 , EA36123, EA36131, EA36158, EA36166, EA36174, EA36182, EA3619, EA36206, EA36502, EA56011, EA56020, EA56038, EA56062, EA56070, EA56100, EA56118, EA56142, EA56194, EA57153, EA58500, EA56070 FOR CONSIDERATION ONLY: EA55019, EA35008, EA35016, EA35024, EA35032, EA35040, EA35059, EA3506 , EA35075, EA35083, EA35091, EA55019, EA55027, EA55035, EA5506A, EA55116, EA55131, EA59052
EA5701	EA37003, EA37046, EA37062, EA37070, EA37089, EA37097, EA57014, EA57022, EA57034, EA57040, EA57057, EA57129, EA57137, EA57145, EA57153, EA57161, EA57170, EA57188, EA57014

Notes

- EA Series part numbers not listed above are no longer available and have no possible replacements.
- EA3AD, EA3A, EA3B, EA3D, EA3CB, EA59, EA99, EB3 and B10 series are no longer available and have no replacements. EA3 can replace EB3 with wiring modification. (See Page 10 of this bulletin)
- EA3 models can also replace Australians Control Model G1. Consult your local distributor for cross-reference details.
- All Universal Shaft models in the above table are supplied as *UniKits*. These include Instruction Sheet, Mounting Screws or Nut and Shaft Adaptors. Solid Shaft models include Instruction Sheet and Mounting Nut. Instruction sheets include wiring and calibration information.

EA-SERIES THERMOSTAT CALIBRATION

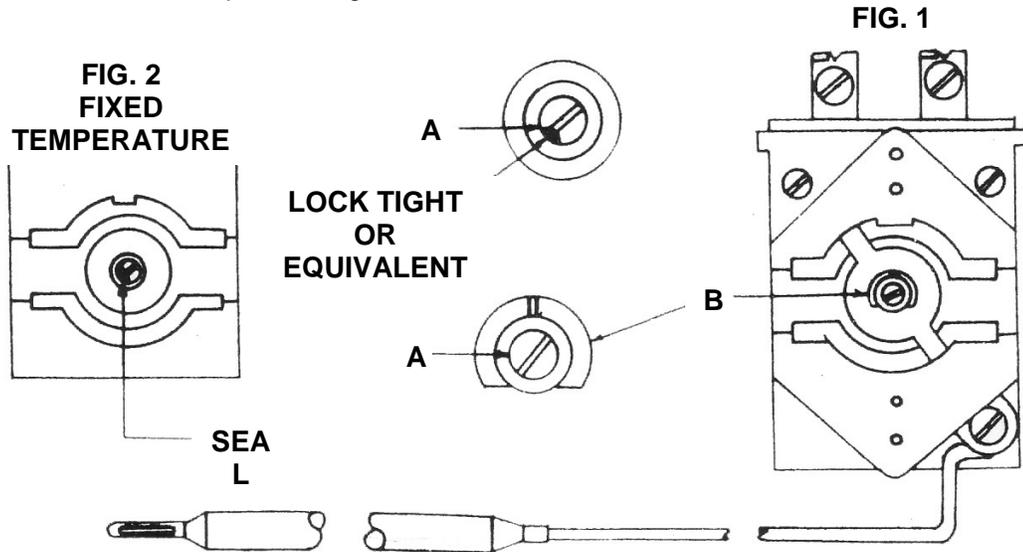
Each thermostat is calibrated at the factory, however if correction is necessary this procedure is to be followed.

FIG. 1 VARIABLE TEMPERATURE

- Use a potentiometer or a good grade thermometer to determine temperature at the location where temperature is required.
- Turn dial of thermostat to a medium temperature setting.
- Allow enough time for temperature to stabilise or until several temperature readings are identical.
- Remove dial from shaft "B".
- Turn screw "A" clockwise to decrease or counterclockwise to increase. (These instructions cover all temperature ranges. Examples of approximate values of ¼ turn of screw "A" for some temperature ranges are given below.)
- Replace dial and reset to original medium temperature setting of step 2.

FIG. 2 FIXED TEMPERATURE

- Follow procedure as outlined for Fig. 1 except omit steps 2, 4 & 6.
- Seal must be broken to turn screw "A".
- Reseal screw "A" with quick setting cement after recalibration.

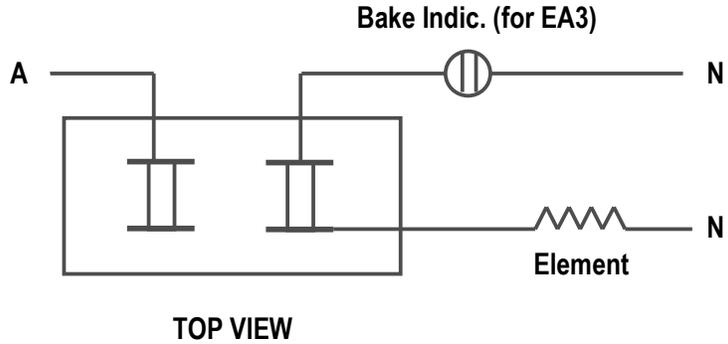
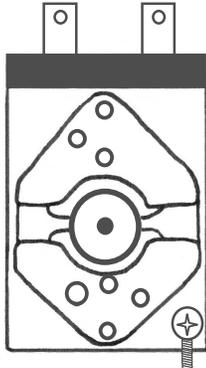


VALUE OF ¼ TURN OF SCREW "A"

TEMPERATURE RANGE	60°-290°C	90°-205°C	26°-205°C	30°-230°C	15°-120°C	10°-32°C	0°-45°C	120°-445°C
APPROX. TEMP CHANGE	19.5°C	10°C	6.7°C	19°C	9.5°C	3.3°C	5.6°C	19.5°C
TEMPERATURE RANGE	30°-60°C							
APPROX. TEMP CHANGE	5.5°C							

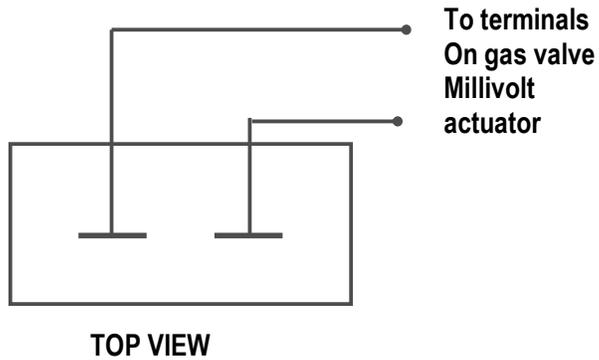
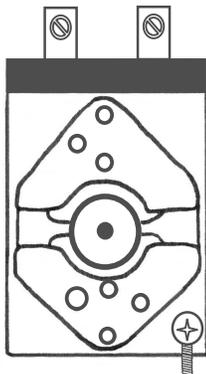
EA-SERIES THERMOSTAT WIRING

EA3 & EA5 MODELS



Note: EA3 has spade terminals as shown – EA5 has screw terminals

EA17 MODELS



WARNING:

- ALL WIRING OF THE THERMOSTAT SHALL CONFORM TO AS3100 AND IS TO BE INSTALLED BY A LICENSED ELECTRICIAN.
- ELECTRICALLY ISOLATE THERMOSTAT FROM MAIN SUPPLY BEFORE DISCONNECTING. FAILURE TO DO SO CAN RESULT IN AN ELECTRIC SHOCK.

AVAILABLE MODELS

Model	Temperature Range	Replaces
EA17700	95-205 degC	EA177007
EA3447	70-290 degC	EA34478
EA5406	70-290 degC	EA54067
EA5497	70-290 degC	EA54972
EA5607	15-120 degC	EA56070
EA5701	95-205 degC	EA57014

Using an EA Thermostat to replace EB

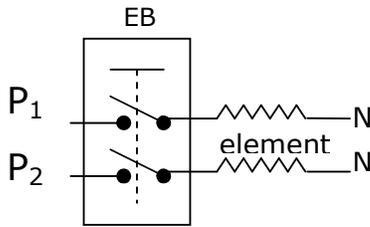
Guidelines for qualified electricians

EB and EA5 are heating thermostats whose contacts open on temp rise.

Please match temperature range from the table

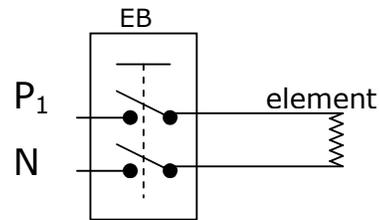
EB3 Series	EA Replacement	Temp Range
EB35257	EA5497	70-290°C
EB35054	EA5701	95-205°C
EB35070	EA5607	15-120°C
DPST 20A 240VAC	SPST 30A 240VAC	

A DPST The EB3 is used to switch 2 phases of 240V ac or 2 elements on 240V ac

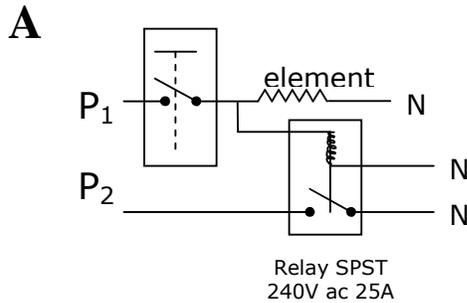


OR

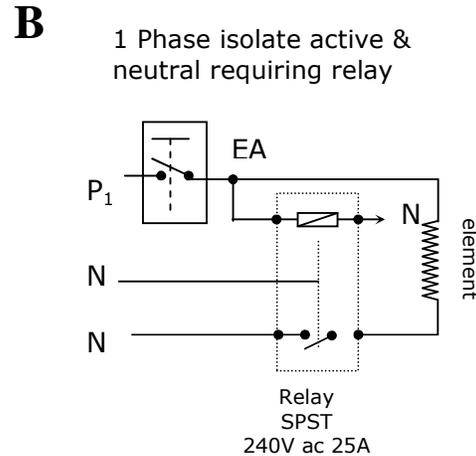
B DPST on 1 Phase. The EB3 is used to isolate both active and neutral links to element.



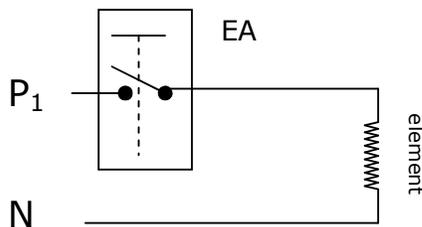
Suggested Wiring Circuits for Replacing EB with EA



OR



C 1 Phase switch only active without relay



Note: Do not use the EA5 to drive the relay coil only. The load from the coil is so small that you will begin to get poor continuity at the contacts after a short period of operation.

Accessories

Accessories for Invensys Controls and Robertshaw Energy Regulators and Thermostats are still available for current models. These include dials, bezels, nut mounting kits and stuffing boxes. The following table summarises the available accessories.

Part Number	Description	Suitable Use
Dial Kits		
102K	Black Dial – LO – OFF – HI	M32314, M55314, M58314, MS4-217
104K	Black Dial – LO – OFF – LO	M82314
105K	Black Dial – Plane with White Dot	All M-Series and EA-Series
P2419K	Black Dial – 1 – 10	All EA-Series, M32314, M55314, M58314, MS4-217
P2638K	Black Dial – 70 – 290 °C	EA3447, EA5406, EA5497
P2662K	Black Dial – 15 – 120 °C	EA5607
P2670K	Black Dial – 95 – 205 °C	EA17700, EA5701
P2793	Black Dial – 95 – 205 °C No Off	EA17700 (Gas Appliances)
Bezels		
D6194K	Bezel 55mm	All M-Series and EA-Series
Stuffing boxes		
P5329K	Stuffing Box 3/8" Kit	
Mounting Kits		
P5003K	Palnut Adaptor Kit	All EA-Series

Disclaimer: Whilst every effort has been made to ensure that the information herein is correct, Invensys Controls Australia Pty Ltd accepts no liability of any kind in respect to the contents of this publication. Due to continual product development, products and specifications are subject to review.

invensys.
Controls

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