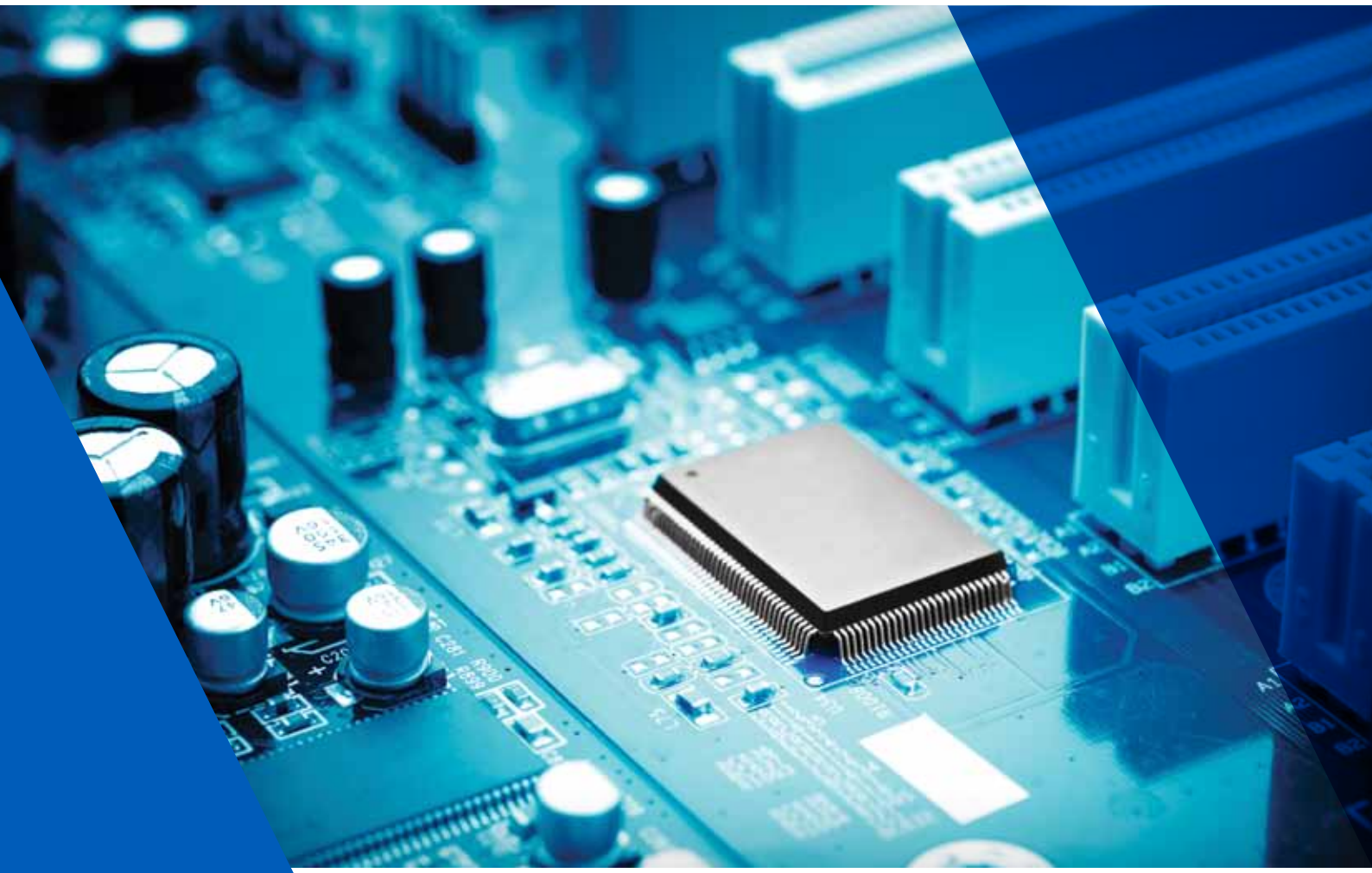
Electro Controls

Product Catalogue 2017



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WATTS®

Contents

63	**Light**	
63	Light Level Transmitter 0-10vdc	ELT
64	**Occupancy**	
64	Occupancy Detector Ceiling Mounted	EO-C
65	P I R Occupancy Detector	EO
66	Microwave Occupancy Detector	MWS1A-PRM
67	**Air Quality & Gas Sensors**	
67	Gas Detector/Transmitter	EGS
68	Gas Monitor Panels	EGD-M ST-MON350
69	Air Quality Transmitter 0-10vdc	EAQ
70	Carbon Dioxide Transmitter 0-10vdc	ECD
71	**Wind Speed / Direction Level**	
71	Wind Speed / Wind Direction Sensor	EWS
72	Wind Speed & Direction Sensor	EWSD
73	**Air Velocity**	
73	Air Velocity / Averaging Pitot Tubes	EVP
74	Air Velocity Transmitter 0-10vdc	EAV
75	**Current Switches / Sensors**	
75	Current Switches Fixed	ESOL ESLT
76	Current Switches Adjustable	ESOL ESLT
77	Current Sensors 0-10vdc/4-20mA	ESOL ESLT
78	**Flow**	
78	Air Flow Switch	EAA
79	Liquid Flow Switch 15mm 22mm	ELF..C
80	Liquid Flow Switch 1/2” - 8”	ELF
81	**Level**	
81	Liquid Level Switch Horizontal	ELL EL
82	Liquid Level Switch Hi/Low	EL
83	Liquid Level Switch Vertical	EL ETF
84	Liquid Level Ultrasonic 4-20mA	ELU
85	Liquid Level Ultrasonic wiring	ELU

86	**Pressure**	
86	Air Differential Pressure Switch	EDA EFS
87	Low Pressure Switch Gas / Air / Liquid	EPG
88	Liquid Pressure Switch	EP
89	Liquid Differential Pressure Switch	EP
90	Air Differential Pressure Transmitter	EDT
91	Liquid Pressure Transmitter	EWT
92	Liquid Diff. Pressure Transmitter	EWDT
93	**Damper Actuators / Valve Motors**	
93	Small 4 / 8 Nm 2 & 3 point	EK4
94	Small 4 / 8 Nm Modulating 0-10vdc	EK4
95	8 / 16 / 24 / 32 Nm 2 & 3 point	E08 E16 E24 E32
96	8 / 16 / 24 / 32 Nm Modulating 0-10vdc	E08 E16 E24 E32
97	8 / 16 / 24 / 32 Nm Modulating Wiring	E08 E16 E24 E32
98	Spring Return Damper/Valve Motors	ER08 ER20
99	Spring Return Damper/Valve wiring	ER08 ER20
100	Damper / Valve Motor W/proof Cover	EE-VMC
101	**Valves / Linkages**	
101	Valve Linkage Mounting Instructions	
102	2 Way Ball Valve	EB
103	3 Way Ball Valve	EB
104	Lift & Lay / Seat Valves	MK MKDN
105	Rotary / Shoe Valves	AB AC F
106	Butterfly Valves	RD RDP
107	Spring Return Zone Valves	EZV
108	Safety Precautions	

THERMOSTATS - MECHANICAL

CAPILLARY THERMOSTATS 1 STAGE

EC.. EC..D / EC..DM EC..W

These products are used to monitor the temperature of air or liquids. Applications include heating and air conditioning systems. The liquid filled sensing element enables a rapid response to temperature changes.

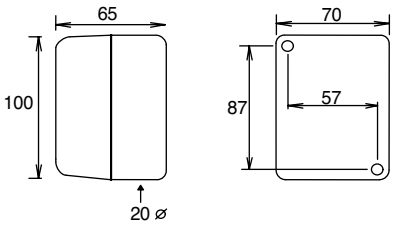
- Adjustment under the cover
- Terminals 0.5-2.5mm² rising clamps
- Copper capillary & bulb
- Volt free contacts
- Max. ambient -40/+70°C
- Thermostats may be calibrated by slowly turning the centre nut on the adjusting spindle.
- Enclosure Flammability UL94-VO

Type	Stages	Range °C	Diff °C	230VAC SPDT	Capillary Length	Bulb mm	Max. Bulb Temp °C	Enclosure
EC-1ML	1	-10/+12	Hand reset open low	15(8)A	1.8m	10 x 100**	200	IP40
EC-2	1	-20/+40	0.5	15(3)A	2m	8 x 140	60	IP43
EC-3	1	-20/+40	1.5	15(6)A	2m	8 x 140	70	IP43
EC-4	1	-20/+40	3.5	15(6)A	2m	8 x 100	180	IP43
EC-5	1	-20/+40	5	15(6)A	2m	8 x 100	180	IP43
EC-6	1	0/100	2	15(4)A	2m	8 x 100	120	IP43
EC-7	1	0/200	5	15(6)A	2m	8 x 70	240	IP43
EC-8	1	0/200	Hand reset open high	15(6)A	2m	8 x 70	240	IP43
EC-3D	1	-15/+45	1.5	15(8)A	rigid stem	includes duct holder	70	IP43*
EC-6D	1	0/70	2	15(8)A	rigid stem	includes duct holder	90	IP43*
EC-6DM	1	30/65	Hand reset open high	15(8)A	rigid stem	includes duct holder	90	IP43*
EC-7DM	1	60/95	Hand reset open high	15(8)A	rigid stem	includes duct holder	115	IP43*
EC-3W	1	-20/+40	1.5	15(6)A	2m	8 x 140	70	IP65
EC-4W	1	-20/+40	3.5	15(6)A	2m	8 x 100	180	IP65
EC-6W	1	0/100	2	15(4)A	2m	8 x 100	120	IP65
EC-7W	1	0/200	5	15(6)A	2m	8 x 70	240	IP65
EC-8W	1	0/200	Hand reset open high	15(6)A	2m	8 x 70	240	IP65

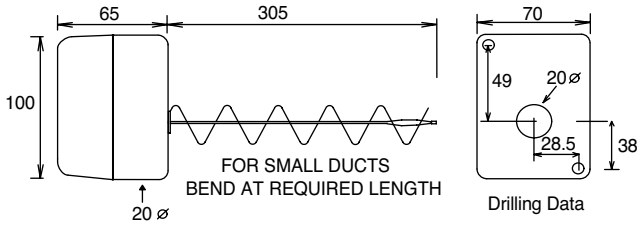
*Also available with IP65 weatherproof enclosure. **Size/shape differs from other EC.. thermostats - does not fit standard pockets.

DIMENSIONS

EC.. / EC..W

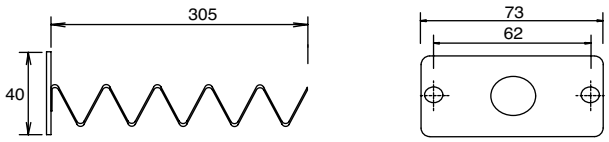


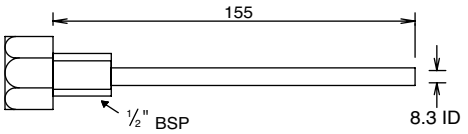
EC..D / EC..DM



ACCESSORIES:

EE-1A Duct bulb holder

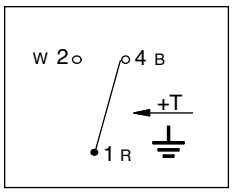




EE-1B Brass Bulbwell
EE-STE Stainless Steel Bulbwell

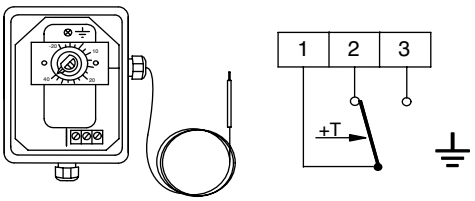
WIRING:

EC-1ML



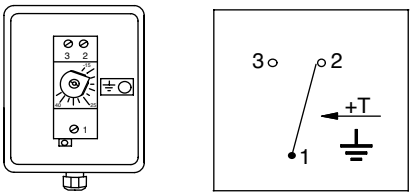
OPEN LOW 1-2 opens on temp fall.
Temp must rise to allow resetting.

EC.. / EC..W



1-2 close on temp fall. 1-3 close on temp rise.

EC..D / EC..DM



OPEN HIGH 1-2 opens on temp rise.
Temp must fall to allow resetting.

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CAPILLARY THERMOSTATS 2-3-4 STAGES

EMC..

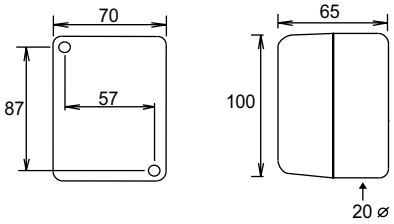
These products can be used to monitor the temperature of air or liquids. Applications include switching multiple heating and air conditioning systems.
The liquid filled sensing element enables a rapid response to temperature changes.

- Adjustment under the cover
- Terminals 0.5-2.5mm² rising clamp
- Copper capillary & bulb
- Volt free contacts
- Max ambient -40/70°C
- Thermostats may be calibrated by slowly turning the centre nut on the adjusting spindle.
- Enclosure Flammability UL94-VO

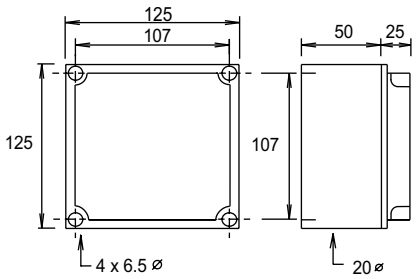
Type	Stages	Range °C	Diff Per Stage °C	Diff. Between Stages °C	230VAC SPDT	Capillary Length	Bulb mm	Max. Bulb Temp °C	Enclosure
EMC-22A	2	- 20/+40	1.5	1/10 adj.	2x15(3)A	2m	8 x 140	60	IP43
EMC-23A	2	0/100	2.5	2/20 adj.	2x15(3)A	2m	8 x 100	120	IP43
EMC-22AW	2	- 20/+40	1.5	1/10 adj.	2x15(3)A	2m	8 x 140	60	IP65
EMC-23AW	2	0/100	2.5	2/20 adj.	2x15(3)A	2m	8 x 100	120	IP65
EMC-341	3/4	- 20/+40	1	1	4x15(3)A	3m	8 x 140	60	IP65
EMC-342	3/4	0/100	2	2.5	4x15(3)A	3m	8 x 100	120	IP65

DIMENSIONS

EMC-22A.. / 23A..

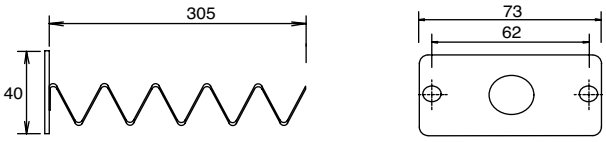


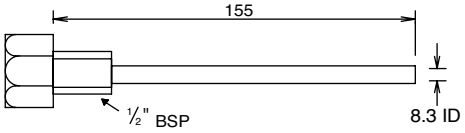
EMC-34..



ACCESSORIES:

EE-1A Duct bulb holder

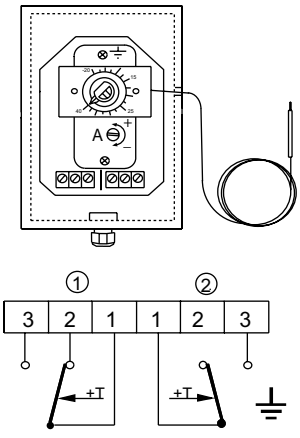




EE-1B Brass Bulbwell
EE-STE Stainless Steel Bulbwell

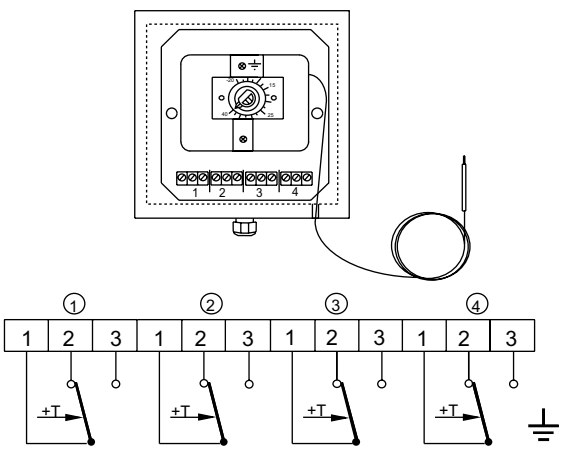
WIRING:

EMC-22..



Diff between stages adjust via screw A
Contact 1-3 close on temp rise.
Contact 1-2 close on temp fall.

EMC-34..



Htg only = wire 1st stg htg to last stg on stat & follow downwards in sequence
Clg only = wire 1st stg clg to 1st stg on stat & follow upwards in sequence
Htg & Clg = wire heating on lower stages & cooling on higher stages

THERMOSTATS - MECHANICAL

FREEZE PROTECTION THERMOSTATS

EFP..

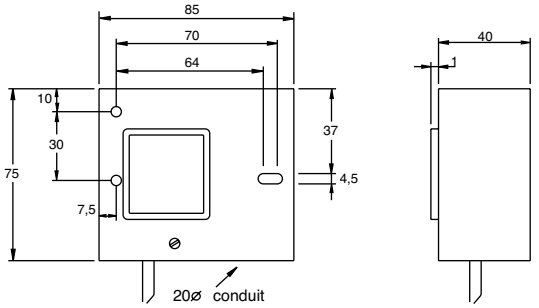
These products are used to prevent the freezing of liquids inside pipes or heating/cooling coils.

Tamperproof adjustment
Copper capillary tin plated
Volt free contacts
Max. ambient -30/+70 C
Enclosure Flammability UL94-V0

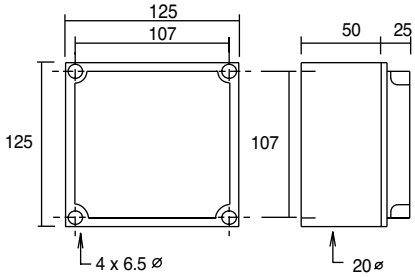
Type	Range °C	Diff °C	230VAC SPDT	Capillary Length	Max. Bulb Temp °C	Enclosure
EFP-1	-15/+15	2	24(10)A	6m	200	IP43
EFP-2	-15/+15	hand reset open low	24(10)A	6m	200	IP43
EFP-3	-15/+15	2	24(10)A	3m	200	IP43
EFP-4	-15/+15	hand reset open low	24(10)A	3m	200	IP43
EFP-1W	-15/+15	2	24(10)A	6m	200	IP65
EFP-2W	-15/+15	hand reset open low	24(10)A	6m	200	IP65
EFP-3W	-15/+15	2	24(10)A	3m	200	IP65
EFP-4W	-15/+15	hand reset open low	24(10)A	3m	200	IP65

DIMENSIONS

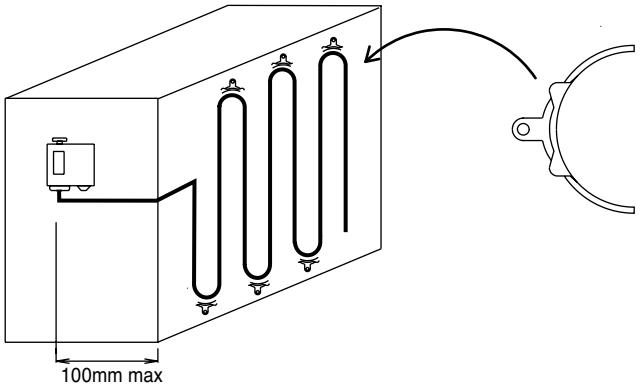
EFP..



EFP..W

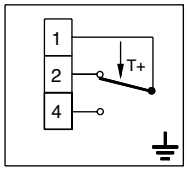


ACCESSORIES:



EE-1C Capillary Clips (per pack of 6)

WIRING:



Open low = Contact 1 - 4 opens on temperature fall.. Temperature must rise to allow resetting

INSTALLATION: Fit the sensor to the front of the coil (downstream/air offside) or wrap around the pipe to guard against freezing at any point. No more than 10cm of the capillary should be outside the controlled space. The thermostat will switch when 30cm or more of any part of the capillary senses the set-point temperature. If the capillary is damaged, the unit will cut-out to the safety side.
THE TEMPERATURE AROUND THE HOUSING SHOULD BE MAINTAINED HIGHER THAN THE SENSOR.

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IMMERSION THERMOSTATS SINGLE/DUAL FUNCTION

EBS.. EBD..

These products are used to monitor liquid temperatures in pipes, boilers, tanks etc. The liquid filled sensing enables a rapid response to temperature changes.
The EBS is a single function thermostat and the EBD dual function has two separate thermostats inside the enclosure.

Hand reset models have a push button on the front cover.

Volt free contacts

Max. ambient 80°C (EBS-1 55°C)

All supplied complete with removable brass pocket ½" BSP.

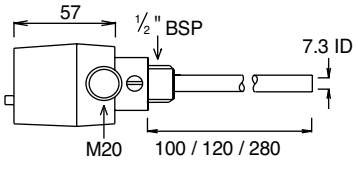
Concealed adjustment

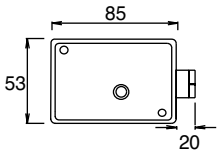
Enclosure Flammability = UL94-V0

Type	Range °C		Diff. °C		230VAC SPDT		Bulbwell	Max. Bulb	Enclosure
	Control	Limit	Control	Limit	Control	Limit	Length	Temp. °C	
EBS-1	0/35	-	0.5	-	10(3)A	-	120	55	IP43
EBS-2	0/80	-	2	-	10(3)A	-	100	100	IP43
EBS-3	35/95	-	4	-	15(5)A	-	100	115	IP43
EBS-4	50/130	-	6	-	15(5)A	-	100	150	IP43
EBS-7	-	30/65	Hand reset open high	-	15(5)A	-	100	90	IP43
EBS-8	-	60/95	Hand reset open high	-	15(5)A	-	100	115	IP43
EBS-9	-	95/130	Hand reset open high	-	15(5)A	-	100	150	IP43
EBS-20/L280	0/70	-	2	-	10(3)A	-	280	90	IP43
EBS-30/L280	35/95	-	4	-	15(5)A	-	280	115	IP43
EBS-70/L280	-	30/65	Hand reset open high	-	15(5)A	-	280	90	IP43
EBS-80/L280	-	60/95	Hand reset open high	-	15(5)A	-	280	115	IP43
EBD-1	0/80	0/80	2	2	10(3)A	10(3)A	100	100	IP43
EBD-2	35/95	35/95	4	4	15(5)A	15(5)A	100	115	IP43
EBD-8	35/95	60/95	4	Hand reset open high	15(5)A	15(5)A	100	115	IP43
EBD-9	50/130	95/130	4	Hand reset	15(5)A	15(5)A	100	115	IP43
EBD-32/L260	35/95	35/95	4	4	15(5)A	15(5)A	260	115	IP43
EBD-38/L260	35/95	60/95	4	Hand reset open high	15(5)A	15(5)A	260	115	IP43

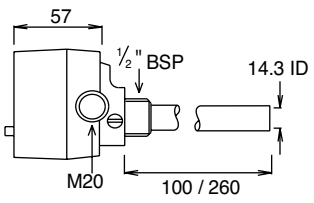
DIMENSIONS

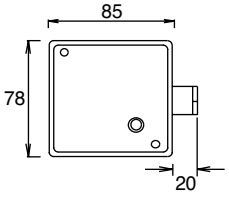
EBS..





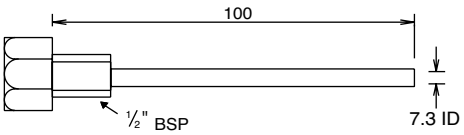
EBD..





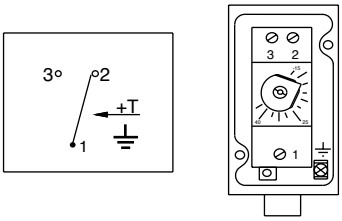
ACCESSORIES:

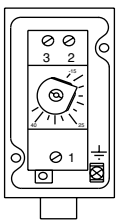
EE-9B	Spare brass pocket	100mm for EBS-2..9	(NOT for EBS-1)
EE-ST9	Stainless steel pocket	100mm for EBS-2..9	(NOT for EBS-1)



WIRING:

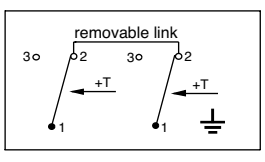
EBS..

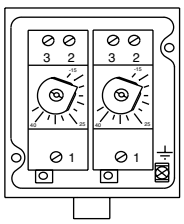




1-2 close on temp fall. 1-3 close on temp rise.

EBD..





OPEN HIGH Contact 1-2 opens on temp rise. Temp must fall to allow resetting

THERMOSTATS - MECHANICAL

STRAP-ON THERMOSTATS

BRC.. ESS..

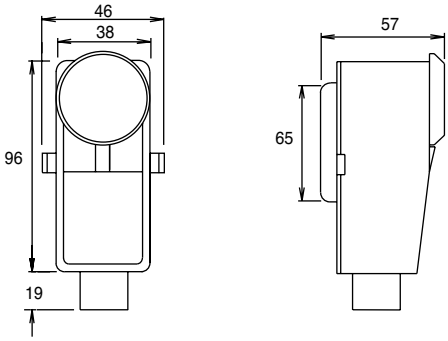
These products can be used to monitor the temperature of liquids in pipes and cylinders.

Volt free contacts
ESS.. Adjustment under the cover
Terminals 0.5-2.5mm
Enclosure Flammability: BRC=UL94-HB
ESS=UL94-V0

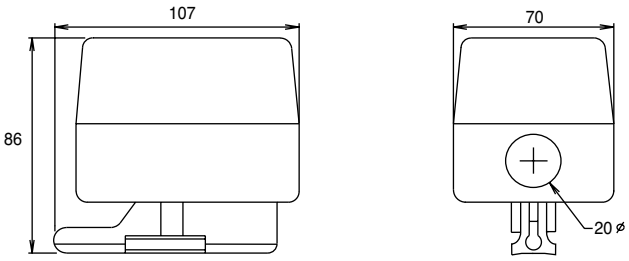
Type	Range °C	Diff °C	230VAC SPDT	Max. Bulb Temp °C	Enclosure
BRC	20/90	5	15(3)A	120	IP30
ESS-1	-25/+45	2	10(3)A	70	IP43
ESS-2	0/70	2	10(3)A	90	IP43
ESS-32	35/95	4	15(5)A	115	IP43
ESS-3	50/130	6	15(5)A	130	IP43
ESS-42	30/65	Hand reset open high	15(5)A	90	IP43
ESS-4	60/95	Hand reset open high	15(5)A	115	IP43

DIMENSIONS

BRC..



ESS..



ACCESSORIES:

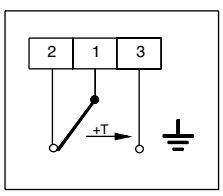
FIXING STRAP FOR BRC

FIXING STRAP FOR ESS
EE-ESS

FIXING STRAP ADJUSTABLE UP TO 150MM DIA. IS INCLUDED.
LONGER FIXING STRAPS ARE AVAILABLE ON REQUEST.

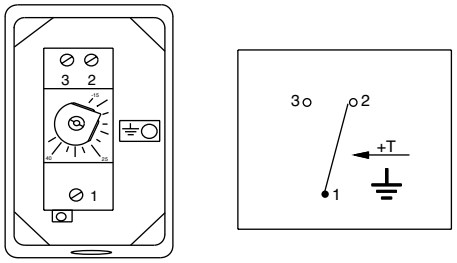
WIRING:

BRC..



Contacts 1-3 close on temperature rise.
Contacts 1-2 close on temperature fall.

ESS..



Contacts 1-3 close on temperature rise.
Contacts 1-2 close on temperature fall.
Open high = Contact 1-2 opens on temperature rise. Temp must fall to allow resetting.

INSTALLATION: Fix the thermostat securely to the pipe. The ambient temperature around the sensor can affect the switching point.

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OUTSIDE FROST THERMOSTATS

EOF..

EOF thermostats are used to monitor temperature outside buildings and switch heating/cooling or other units in the event of high/low temperatures. The EOF-01 is a single function unit and the EOF-21 is a dual function unit which has 2 separate thermostats inside one enclosure.

Adjustment under the cover on all models

Enclosure Flammability = UL94-V2

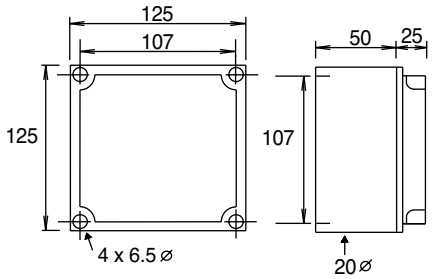
EOF-01 is single function

EOF-21 is dual function
(2 thermostats inside one enclosure)

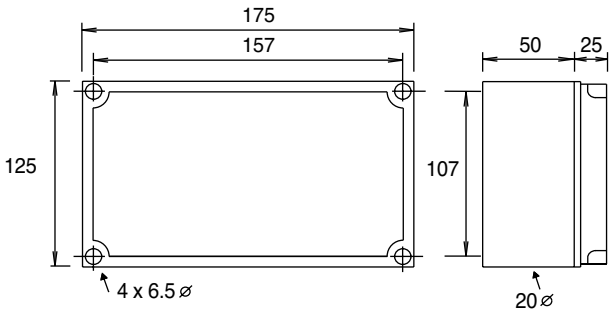
Type	Range °C	Diff °C	230VAC SPDT	Sensing Element	Max. Ambient °C	Enclosure
EOF-01	-20/+30	1	10(3)A	Bimetal	60	IP65
EOF-21	-20/+30 & -20/+30	1	2x10(3)A	Bimetal	60	IP65

DIMENSIONS

EOF-01

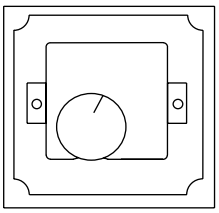


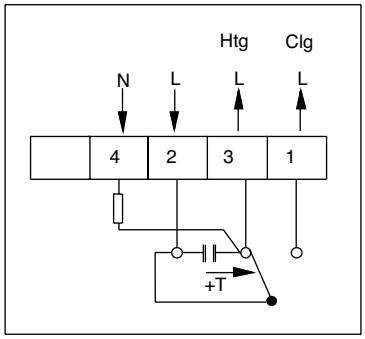
EOF-21



WIRING:

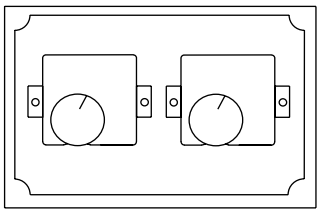
EOF-01

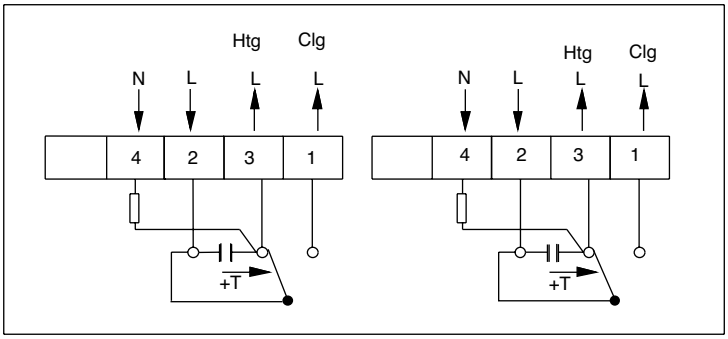




On temperature rise 2-1 close
On temperature fall 2-3 close

EOF-21





On temperature rise 2-1 close
On temperature fall 2-3 close

INSTALLATION: Outside Thermostats & Sensors which are used for frost protection should be mounted on the North side of the building. If this is not possible, shield the sensor from direct sunlight.

THERMOSTATS - MECHANICAL

SPACE THERMOSTATS

ECS..

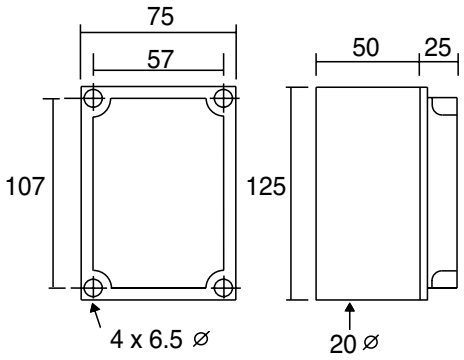
Type ECS thermostats monitor temperatures inside factories, greenhouses and areas subject to high humidity or regular washdown processes. The liquid filled sensing elements are fixed to the side of the weatherproof enclosures.

Adjustment under the cover
Terminals 0.5-2.5mm rising clamps
Enclosure Flammability = UL94-V2

Type	Range °C	Diff °C	230VAC SPDT		Sensing Element	Max.Ambient °C	Enclosure
ECS-3	-20/+40	1.5	15(6)A	Volt free	Bellows	60	IP65
ECS-4	-20/+40	3.5	15(6)A	Volt free	Bellows	60	IP65
ECS-6	0/80	2.5	15(4)A	Volt free	Bellows	80	IP65

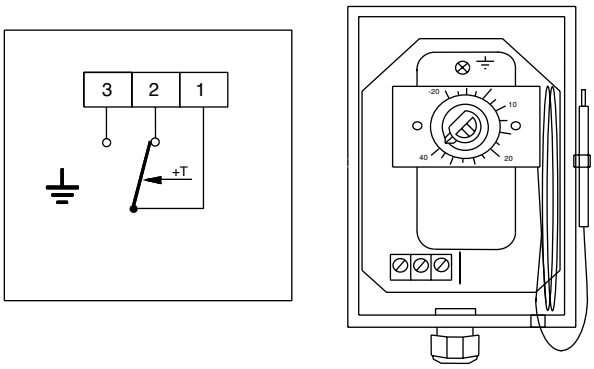
DIMENSIONS

ECS..



WIRING:

ECS..



Contact 1-2 close on temp fall.

Contact 1-3 close on temp rise.

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ROOM THERMOSTATS 1 STAGE

EOF..

These products can be used to monitor the temperature inside buildings and switch heating, cooling or other units. These units are tamperproof.

TA-2
Main adjustment via knob.
Backplate for 1 gang BS box is included.

RTBSB-001.010/045/048
Knob adjustment only.
Range and limit stops provided.
Order backplate separately.
Enclosure Flammability = UL94-V0

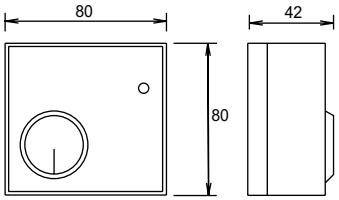
RTBSB-001.910
Adjustment under the cover.

Type	Stages	Range °C	Diff °C approx	230VAC Element		Function	Sensing	Enclosure
TA-2	1	5/30	1	SPDT 10(2.5)A	Volt Free Contacts	Htg or Clg	Bellows	IP20
RTBSB-001.045	1	-20/+30	0.5	SPDT 10(3)A	-	Htg or Clg	Bimetal	IP30
RTBSB-001.010	1	5/30	0.5	SPDT 10(3)A	-	Htg or Clg	Bimetal	IP30
RTBSB-001.048	1	10/60	0.5	SPDT 10(3)A	-	Htg or Clg	Bimetal	IP30
RTBSB-001.910*	1	5/30	0.5	SPDT 10(3)A	-	Htg or Clg	Bimetal	IP30

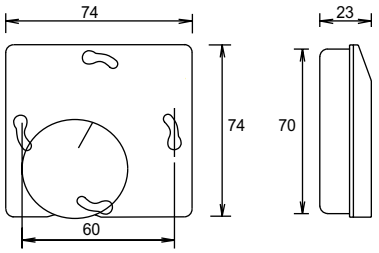
* Concealed adjustment.

DIMENSIONS

TA-2



RTBSB..



ACCESSORIES:

EG-1000	Stat Guard Internal Dims	133 H x 155 W x 70 D
EG-2000	Stat Guard Internal Dims	102 H x 123 W x 60 D
EG-3000	Stat Guard Internal Dims	123 H x 196 W x 70 D

High impact polycarbonate, virtually unbreakable. Supplied with lock & key

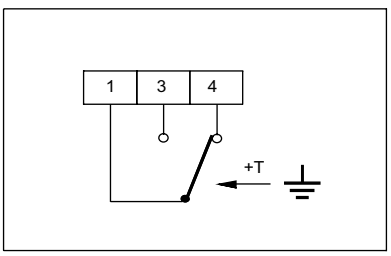
EE-BP2 **Backplate for** RTBSB.. **will fit square or round outlet boxes.**

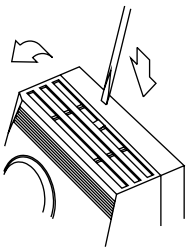
EG..

EE-8P2

WIRING:

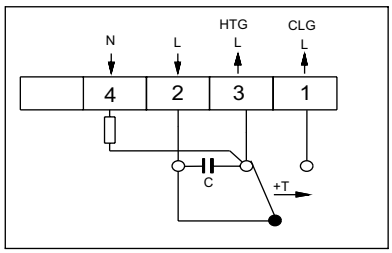
TA-2





To remove the TA-2 front cover and access the terminals, release the top clip using a small, flat screwdriver.

RTBSB-001.010/045/048/910



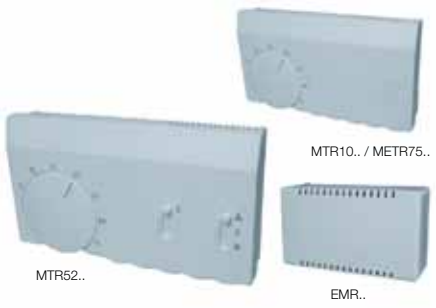
INSTALLATION:

Install at a height of approx. 1.5m
Keep away from radiators, direct sunlight & other heat sources.

THERMOSTATS - MECHANICAL

ROOM THERMOSTATS 2-3-4 STAGES

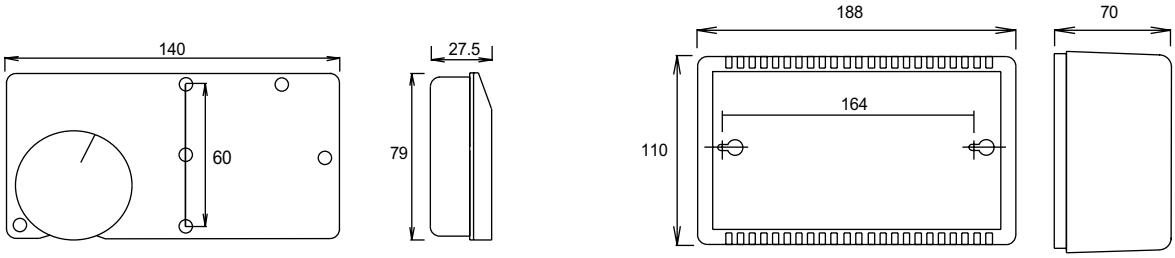
These products can be used to monitor the temperature inside buildings. Up to 4 stages are available to control multiple heating/cooling or other units in various combinations.



MTR..
Knob adjustment with range and limit stops.
Enclosure Flammability = UL94-V0
EMR..
Adjustment under the cover.
For various combinations of htg/clg.
Volt free contacts
Terminals 0.5-2.5mm² rising clamps

Type	Stages	Range °C	Diff Per Stage °C	Diff. Between Stages °C	Switch Rating 230VAC	Function	Sensing Element	Enclosure
MTR10-005	2	5/30	1	2	2 x 10(3)A	1 Htg + 1 Clg	Bimetal	IP30
METR75-820	2	5/30	1	0.5/5 adj.	2 x 8(3)A	2 Htg	NTC	IP30
					On-Off switch			
MTR52-018	2	5/30	1	2	2 x 10(3)A	1 Htg + 1 Clg	Bimetal	IP30
					On-Off switch & 3 speed fan switch			
EMR-22A	2	0/50	1	1/10 adj.	2 x SPDT 15(3)A Volt free	Htg/Clg	Bellows	IP30
EMR-34	3/4	0/50	1	1	4 x SPDT 15(3)A Volt free	Htg/Clg	Bellows	IP30

MTR..

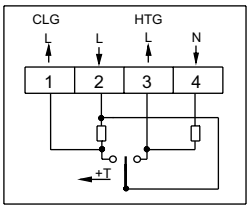


ACCESSORIES:

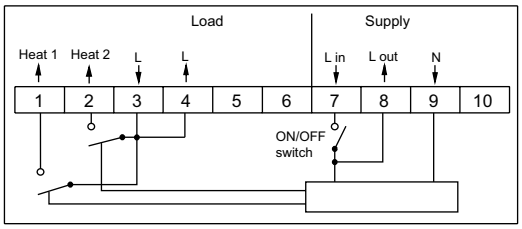
EG-1000	Stat Guard Internal	Dims 133 H x 155 W x 70 D
EG-2000	Stat Guard Internal	Dims 102 H x 123 W x 60 D
EG-3000	Stat Guard Internal	Dims 123 H x 196 W x 70 D

(Guards are not suitable for EMR..)
High impact polycarbonate, virtually unbreakable. Supplied with lock & key

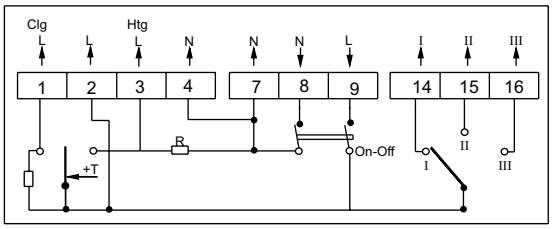
WIRING:



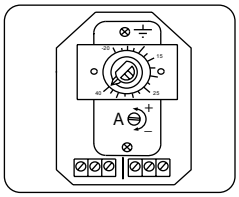
METR75-820



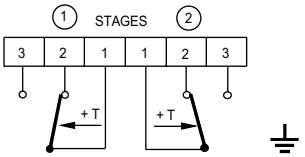
MTR52-018

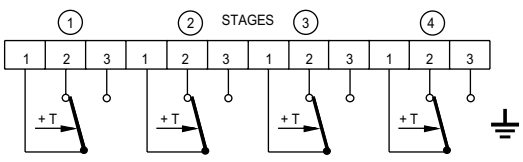


EMR-34



Diff between stages adjust via screw A





Htg only = wire 1st stg htg to last stg on stat & follow downwards in sequence
Clg only = wire 1st stg clg to 1st stg on stat & follow upwards in sequence
Htg & Clg = wire heating on lower stages & cooling on higher stages

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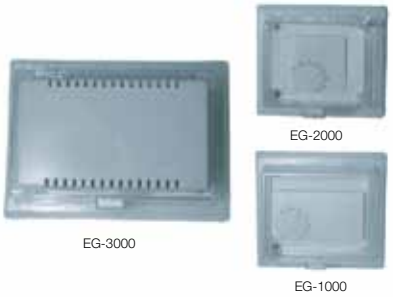
THERMOSTAT GUARDS

A range of transparent, high impact, polycarbonate thermostat guards for use with a variety of thermostats/sensors etc.
The guards screw fix to the wall over the existing thermostat.



Supplied with lock and key

Ideal for use in public areas, sports halls etc.

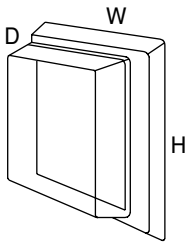
Flammability = UL94-V0

Self locking snap-lock cover, use key to unlock.

Type	Application Examples		Description	
EG-1000	MTR10..	Virtually unbreakable	Unobstructed airflow	Tamperproof
EG-2000	TA-2, PTR01.. ER.. EH.. EHR..	Virtually unbreakable	Unobstructed airflow	Tamperproof
EG-3000	Various (Not suitable for EMR..)	Virtually unbreakable	Unobstructed airflow	Tamperproof
EG-KEY				

DIMENSIONS

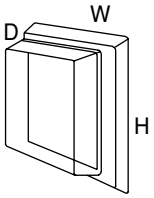
EG-1000



EXTERNAL
H 192
W 212
D 70

INTERNAL
H 133
W 155
D 70

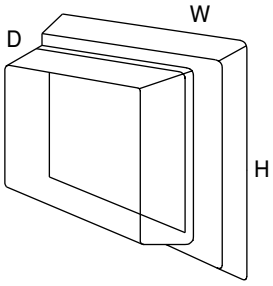
EG-2000



EXTERNAL
H 152
W 170
D 60

INTERNAL
H 102
W 123
D 60

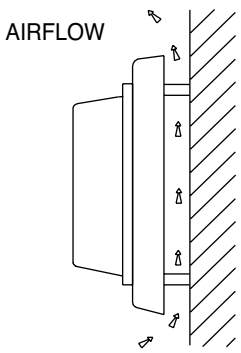
EG-3000



EXTERNAL
H 181
W 251
D 70

INTERNAL
H 123
W 196
D 70

INSTALLATION:



THERMOSTATS - ELECTRONIC

SENSORS / ADJUSTERS / DISPLAYS FOR ETE.. THERMOSTATS / E13.. CONTROLLERS

E10..

- NTC sensors, adjusters & displays for use with ETE.. Electroic Thermostats / Thermometers & E13.. Temperature Controllers.

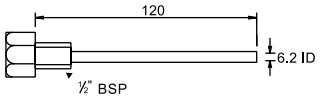
Enclosure Flammability:
E10-D, I, S, X = UL94-V0
E10-H, R, V = L94-HB
E10-T = UL94-V2

Type	Function	Description	Dimensions	Protection
E10-B	Bead sensor	With 2 way terminal strip	–	IP00
E10-C	Cable Sensor	With 2mm cable	Sensor 7.1 mm dia x 40	IP65
E10-D	Duct sensor	Probe length 160mm	Approx 80 dia x 55	IP65
E10-DA	Duct Averaging	Probe length160mm (use 2 x E10-DA for averaging)	Approx 80 dia x 55	IP65
E10-H	Black bulb sensor	For radiant tube heaters	85H x 85W x 30D + bulb 16mm	IP30
E10-I	Immersion sensor	**ORDER POCKET SEPARATELY** Probe length 120mm	Approx 80 dia x 55	IP65
E10-K	Fan coil sensor	With duct flange & 2m cable	Duct tube 80mm long	IP65
E10-R	Room sensor	Can be mounted on square or round outlet box	85H x 85W x 30D	IP30
E10-RA	Room sensor	As E10-R (use 2 x E10-RA for averaging)	85H x 85W x 30D	IP30
E10-S	Strap-On sensor	Includes fixing strap for up to 6" dia. Pipe. 2m cable	Approx 80 dia x 55	IP65
E10-V	Room sensor + Knob	With knob adj ±4°C above & below main set point knob setting	85H x 85W x 30d + knob	IP30
E10 -X	Outside sensor	Weather proof	Approx 80 dia x 55	IP65
E10-P50	Setpoint adjuster	-10/+50°C Front panel moubting	48H x 48W	
E10-P95	Setpoint adjuster	25/95°C Front panel mounting	48H x 48W	
E10-P4	Setpoint adjuster	±4°C Front panel mounting. For minor adjustment of main set point knob setting	48H x 48W	
E10-T	Digital display	Selectable -10/+50°C or 25/95°C		IP00
		230 VAC supply. Front panel mounting 48H x 96W x 104D Panel cut-out	44H x 91W	
		Only for use with ETE.. Thermostats or E13.. Temperature Controllers		
OPTIONAL	**E10-T**.. ONLY	L24 = 24VAC supply		

Temperature °C:	-10	-5	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
Resistance KΩ:	54	40	30	25	20.5	15.2	12	10	7.8	6.2	5	4	3.3	2.7	2.2	2	1.6	1.4	1.1	1	0.9	0.8

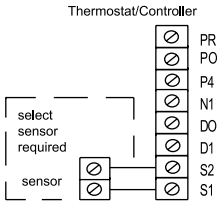
ACCESSORIES: EE-STK ½" BSP x 120mm Stainless Steel pocket for E10-I

Special Face Plates are available in Brass, White, Satin and others on request (see page G2)

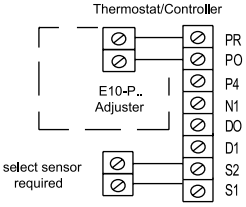


WIRING:

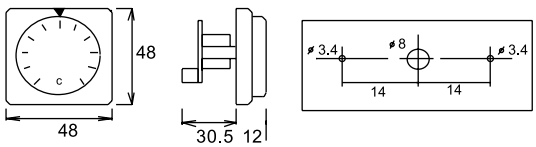
E10.. SENSORS



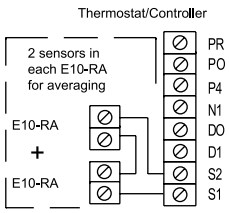
E10-P..



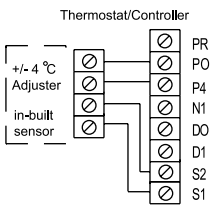
DRILLING DETAIL FOR E10-P..



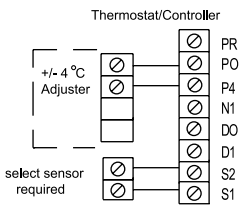
E10-RA



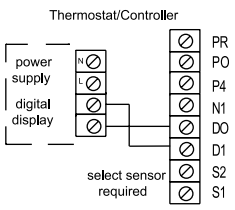
E10-V using in-built sensor



E10-V using remote sensor



E10-T



INSTALLATION: Terminals 0.5 -2.5mm² Max length 100mm.

Sensor cable size 7/0.2mm Screened cable is recommended.

Keep away from power cables/units which may cause interference. The screen should be earthed at the controller end only.

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ELECTRONIC THERMOSTAT - 1 STAGE DIGITAL

ETE-1D

This product monitors the temperature of air or liquid in a heating system and controls heating or cooling units in response to temperature changes

LCD display.
Digital set up of control mode, set point, night set back and differential.
Volt free relay contacts.
Ambient -10 to +50 deg C.
Temperature resolution 0.5 deg C.
°C/°F display (ETE-1D mode only).
Night setback is standard via optional time switch.
Compatible with the functions and accessories of the ETE-150 and ETE-195 range.

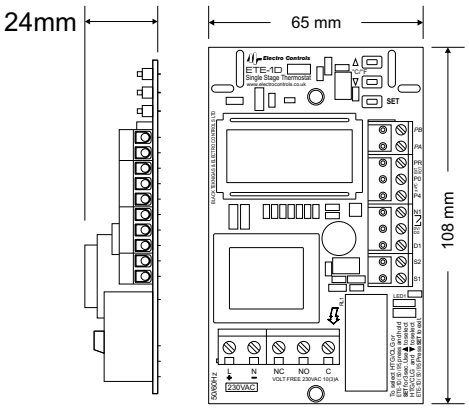
Type	Range Deg C	Differential Deg C	Night set Range C	Supply +- 10%	230VAC SPDT	Power Consumed	Protection
ETE-1D	-10/+95	0.5/10	0-40	230VAC	10(3)A	0.5W max	IP00

Add L24 for optional 24VAC supply. A 120VAC version is available on request.

ACCESSORIES
See table for the valid accessories

Accessory type	Accessory part number	Selected Product mode ETE-1D	ETE-150	ETE-195
Temperature sensors	E10-B/C/D/DA/G./H/I/K/R/RA/S/V/X	✓	✓	✓
Set point adjuster	E10-P4,E10-P50 and E10-P95		✓	✓
Digital Set point adjuster	E10-S110	✓		
Digital room sensor	E10-RD	✓		
Analogue Display	E10-T		✓	✓
Digital display	E10-TD	✓		
Enclosure	EE-M1T	✓	✓	✓
DIN rail holder	EE-DR1	✓	✓	✓

DIMENSIONS/TERMINATIONS:

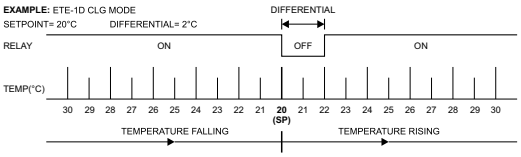


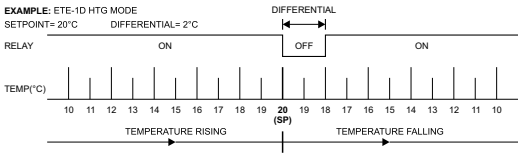
Connections

L and N	230VAC or 24VAC supply
NO,C,NC	Volt free relay connections
S1 and S2	Sensor
0 and N1	Night setback
PA and PB	E10-S110 Remote set point adjuster
P4 and P0	E10-P4
P0 and PR	E10-P50 or E10-P95
D1 and D0	E10-T

TIMING DIAGRAM:

This diagram shows some examples of the relay state with rising and falling temperatures for the cooling and heating modes.





SET UP:

Turn on the power. Momentarily the display will show all the screen characters then the Product mode EtE1D (ETE-1D), EtE5D (ETE-150) or EtE95 (ETE-195) and will settle to show HTG/CLG, TEMP and the actual temperature. This is the main menu or Temperature screen.
To select HTG/CLG and one of the Product modes ETE-1D, ETE-150 or ETE-195 press the set button for 3 sec. HTG/CLG and the last selected Product mode will flash.
Use ↓ button to select either EtE1D, EtE5D or EtE95.
Use ↑ button to select either HTG or CLG
Press SET briefly to exit.
Briefly press SET repeatedly to select the required parameters of SETPOINT, NIGHT SET and DIFFERENTIAL. The numerical values of these parameters will be blinking and the ↑↓ buttons can be used to set the numerical value required.
Whilst setting any parameter if the buttons are left for 10 sec the screen will return to the Temperature screen.
In the Temperature screen use of the ↑↓ buttons will toggle between °C and °F if required.

DIAGNOSTIC MESSAGES

SEnOP	Sensor open circuit.
SEnSH	Sensor short circuit
Lo/ H,	Set temperature below or above product range
ErrPA	E10-S110 short circuit (ETE-1D only). Once this problem has been addressed press SET to revert to normal operation.

INSTALLATION:

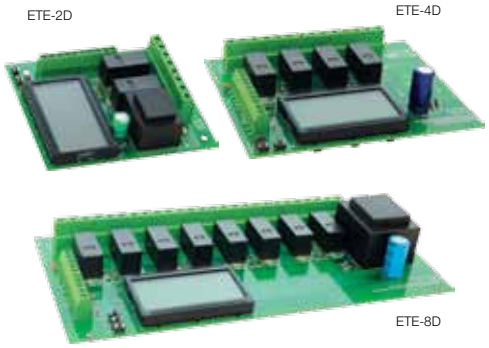
Observe the local regulations regarding electrical installations. Size the power supply cables according to the load.
The minimum sensor cable size is 7/0.2mm with a max length of 100m. Screened cable is recommended and the screen should be earthed at the controller end only. Keep supply and sensor cables away from other power cables and devices which may cause interference.

THERMOSTATS - ELECTRONIC

ELECTRONIC THERMOSTAT - 2-4-6-8 STAGE DIGITAL

ETE-..D

These products monitor the temperature of air or liquid in a heating system and control heating or cooling units in response to temperature changes.



LCD display.
Digital set up of control mode, Set Point, Night Setback, Time Delay, Differential per Stage and Difference between Stages.
Volt free relay contacts.
Ambient -10 to +50 deg C.
Temperature resolution 0.5 deg C.
°C or °F selection (ETE-2D, 4D, 6D or 8D only).
Time delay 1-200 seconds all models.
Night Setback is standard via optional time switch.
Compatible with the functions and accessories of the ETE-(2/4/6/8)50 and ETE-(2/4/6/8)95.

Type	Stages	Range (°C)	Differential per Stage (°C)	Difference b/w Stages (°C)	Night Set Range (°C)	Supply +- 10%	230VAC SPDT	Power Consumed
ETE-2D	2	-10/+95	0.5/5 adj	1/15 adj	0-40	230VAC	10(3)A	2VA max
ETE-4D	4	-10/+95	0.5/3 adj	1/6 adj	0-40	230VAC	10(3)A	3VA max
ETE-6D	6	-10/+95	0.5/3 adj	1/3 adj	0-40	230VAC	10(3)A	5VA max
ETE-8D	8	-10/+95	0.5/3 adj	1/3 adj	0-40	230VAC	10(3)A	5VA max

Add L24 for optional 24VAC/DC supply. A 120VAC version is available on request

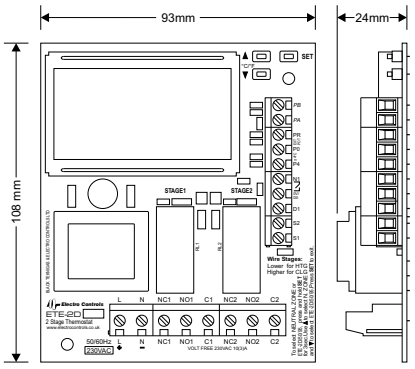
ACCESSORIES

See table below for the valid accessories

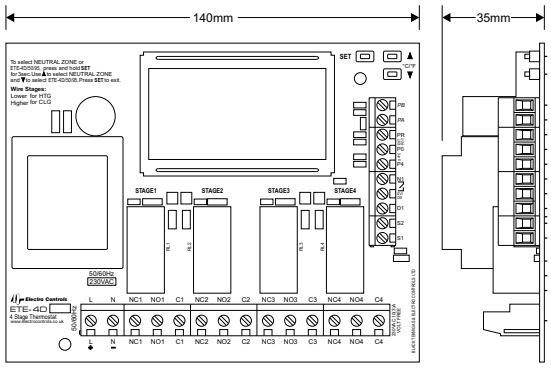
Accessory type	Accessory part number	Selected Product mode		
		ETE-2D,4D,6D or 8D	ETE-250,450,650 or 850	ETE-295,495, 695 or 895
Temperature sensors	E10-B/C/D/DA/G./H/I/K/R/RA/S/V/X	✓	✓	✓
Set point adjuster	E10-P4,E10-P50 and E10-P95		✓	✓
Digital Set point adjuster	E10-S110	✓		
Digital room sensor	E10-RD	✓		
Analogue Display	E10-T		✓	✓
Digital display	E10-TD	✓		
	EE-M2T Enclosure for ETE-2D	EE-DR6 Din rail holder for ETE-2D		
	EE-M3T Enclosure for ETE-4D	EE-DR7 Din rail holder for ETE-4D		
	EE-M5T Enclosure for ETE-6D and 8D	EE-DR5 Din rail holder for ETE-6D and 8D		

DIMENSIONS/TERMINATIONS:

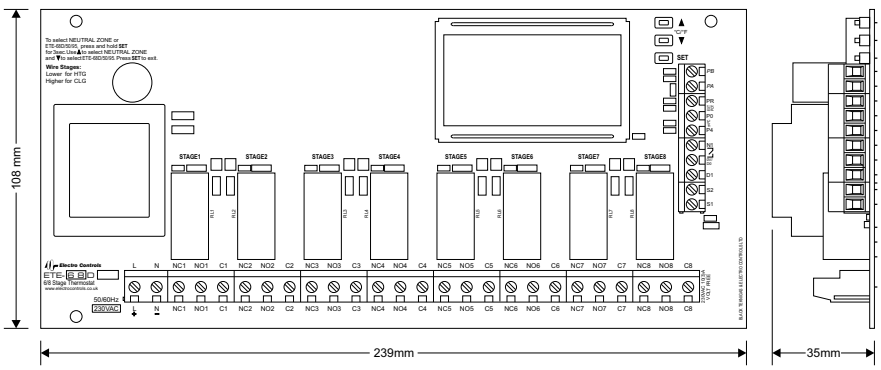
ETE-2D



ETE-4D



ETE-8D



Connections

L+ and N-	230VAC or 24VAC/DC supply
NC,NO,C	Volt free relay connections
S1 and S2	Sensor
0V and N1	Night setback
PA and PB	E10-S110 Remote set point adjuster
P4 and P0	E10-P4
P0 and PR	E10-P50 or E10-P95
D1 and D0	E10-T

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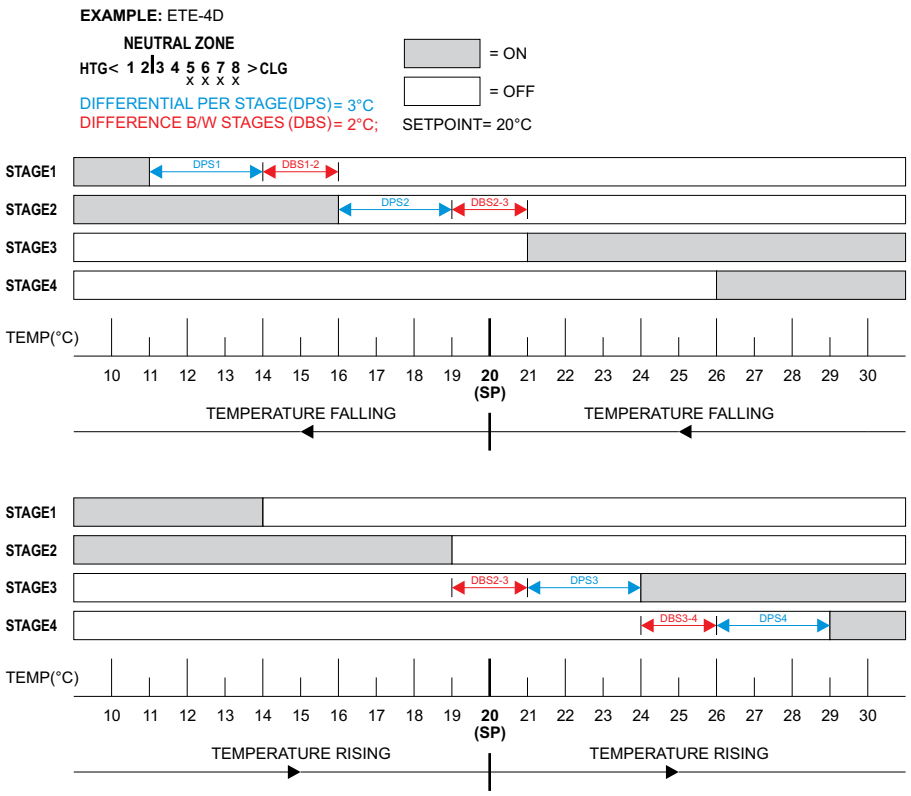
MOUNTING DIMENSIONS:

Type	
ETE-2D	2 holes on diagonal at 117.15mm centres
ETE-4D	2 holes on diagonal at 134.5mm centres
ETE-6D and **8D**	3 holes, X dim 215mm centres, Y dim 100mm centres

TIMING DIAGRAM:

The diagram below shows an example on the ETE-4D relay states with rising and falling temperatures for the situation with the Neutral Zone set at 2 stages of heating and 2 stages of cooling.



SET UP:

Turn on the power. Momentarily the display will show all the screen characters then the Product mode EtE4D (if the product is ETE-4D), EtE5D or ete95 and will settle to show the **NEUTRAL ZONE**, **TEMPERATURE** and the actual temperature. This is the main menu or Temperature screen.
To select the NEUTRAL ZONE (the number of HTG/CLG stages) and one of the Product modes ETE4D, ETE5D or ETE95, press the **SET** button for 3 sec. The NEUTRAL ZONE cursor (▌) and the last selected Product e.g. if the product is ETE-4D, ete4d mode will blink.
Use ▲ button to select the NEUTRAL ZONE required.
Use ▼ button to select either ETE4D, ETE5D or ETE95.
Press **SET** briefly to exit.
Briefly press **SET** repeatedly to select the required parameters of **SET POINT, NIGHT SETBACK, TIME DELAY, DIFFERENTIAL PER STAGE** and **DIFFERENCE B/W STAGES**. The numerical values of these parameters will be blinking and the ▲▼ buttons can be used to set the numerical value required.
Whilst setting any parameter if the buttons are left for 10 sec the screen will return to the Temperature screen.
In the Temperature screen use of the ▲▼ buttons will toggle between °C and °F if required.

SENOP	Sensor open circuit.
SENSH	Sensor short circuit
LO/ H,	Set temperature below or above product range
ERRPA	E10-S110 short circuit (ETE-2/4/6/8D only). Once this problem has been addressed press **SET** to revert to normal operation.

Observe the local regulations regarding electrical installations.
Size the power supply cables according to the load.
The minimum sensor cable size is 7/0.2mm with a max length of 100m. screened cable is recommended and the screen should be earthed at the controller end only.
Keep supply and sensor cables away from other power cables and devices which may cause interference.

ELECTRONIC THERMOSTAT/THERMOMETER WITH DISPLAY

ETE-D4/D6

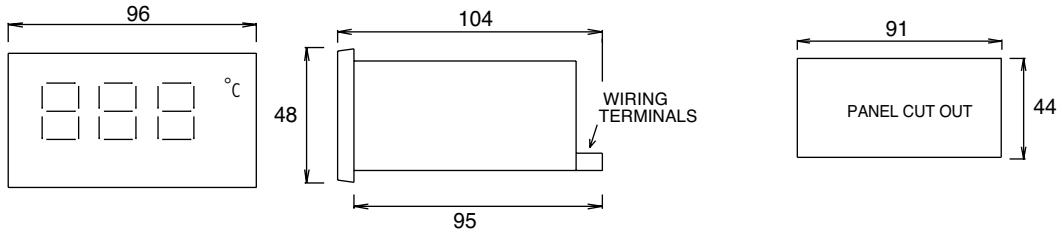
- Both products are Front Panel mounted with a digital display which indicates the sensed temperature.
  The ETE-D4 is suitable for controlling valves, motors, fans etc and heating or cooling devices.
  Type ETE-D6 is a STAND ALONE THERMOMETER.

- Volt free contacts
- Accuracy approx 1% of range
- ORDER DISPLAY UNIT + SENSOR ONLY
- For use with E10.. SENSORS ONLY - SEE SEPARATE DATA SHEET
- NOT for use with E10.. REMOTE ADJUSTERS & DISPLAY units or ETE.. THERMOSTATS
- Enclosure Flammability = UL94-V2

Type	Description	Stages	Display	Range ° C Selectable	Diff °C	Supply	230VAC SPDT	Power Consumption	Mounting	Enclosure
ETE-D4	Thermostat	1	Digital	-10/+50 or 25/95	0.5/10 adj	230VAC	10(3)A	3.3VA	Front Panel	IP00
ETE-D6	Thermometer	–	Digital	-10/+50 or 25/95	–	230VAC	–	3.3VA	Front Panel	IP00

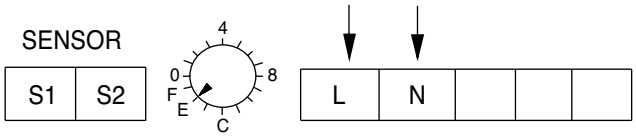
OPTIONAL L24 = 24VAC supply

DIMENSIONS **ETE-D4/D6**



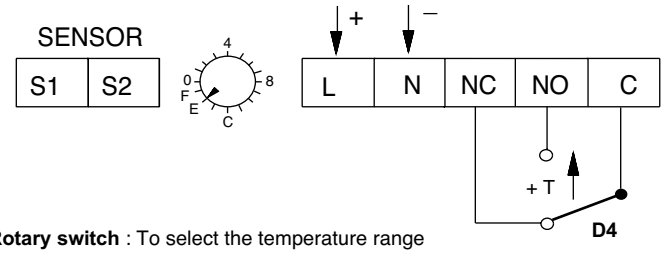
Fixing brackets & screws are provided.

WIRING: **ETE-D6**



Rotary switch: To select the temperature range:
Position E -10/+50 C Position F 25/95 C

WIRING: **ETE-D4**



On increase to the setpoint C-NO makes

On decrease (diff) C-NC makes

Rotary switch : To select the temperature range
Position E -10/+50 C Position F 25/95 C

ADJUSTMENT: **ETE-D4**

Press either button on the front panel and the current Setpoint is displayed. Adjust to the required value by pressing the buttons (left = decrease, right = increase) The Diff is then displayed which can also be adjusted in the same way, if required.

After the adjustments have been made, the sensed temperature will be displayed automatically.

INSTALLATION: **ETE-D4/D6**

Terminals 0.5-2.5mm
Screened cable is recommended.
Keep sensor/control signal wires away from power cables/units which may cause interference.
Sensor / control signal cable size 7/0 . 2 m m Max length 100m
The screen should be earthed at controller end only.

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TEMPERATURE CONTROLLERS 0-10VDC PROPORTIONAL 1 - 2 STAGES

ETC..

These products can monitor the temperature inside buildings, rooms, ducts (return air), tanks, pipes etc and give a 0-10vdc output signal linear across the desired proportional band. Suitable to control damper motors, valve actuators, step controls, relay modules & thyristors etc. The duct unit should be mounted in the return air. If multi-stages of heating and cooling are required, use the ETC. 52 and 2 sets of relay modules ie. 2 x E2RM etc.

NTC thermistor sensor
Supply 24VAC/DC ±15%
Power consumption 15mA
Load >10KΩ
Adjustment under the cover
Enclosure Flammability
ETC-R.. = UL94-HB
ETC-D, ETC-I = UL94-V0

Type	Mounting	Range °C	Prop Band °C	Neutral Zone °C	Output Signal	Function	Sensor NTC	Enclosure
ETC-R50	Room	0/+50	1/10 adj.	-	0-10vdc	Htg or Clg	In-built	IP30
ETC-R52	Room	0/+50	1/10 adj.	1/6 adj.	2x0-10vdc	Htg + Clg	In-built	IP30
ETC-R30V	Room	15/30	1/10 adj.	-	0-10vdc	Htg or Clg	In-built	IP30
ETC-R32V	Room	15/30	1/10 adj.	1/6 adj.	2x0-10vdc	Htg + Clg	In-built	IP30
ETC-D50	Duct	-10/+50	1/10 adj.	-	0-10vdc	Htg or Clg	In-built	IP65
ETC-D52	Duct	-10/+50	1/10 adj.	1/6 adj.	2x0-10vdc	Htg + Clg	In-built	IP65
ETC-D95	Duct	25/95	1/10 adj.		0-10vdc	Htg or Clg	In-built	IP65
ETC-I50	Immersion	-10/+50	1/10 adj.	-	0-10vdc	Htg or Clg	In-built	IP65
ETC-I95	Immersion	25/95	1/10 adj.	-	0-10vdc	Htg or Clg	In-built	IP65

ORDER POCKET SEPARATELY – SEE BELOW

DIMENSIONS

ETC-I.. Approx 80dia x 55 Probe length 120mm

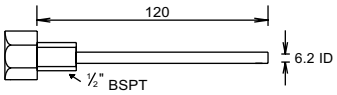
ETC-R.. 85H x 85W x 30D Can be mounted on square or round outlet box

ETC-D.. Approx 80dia x 55 Probe length 160mm

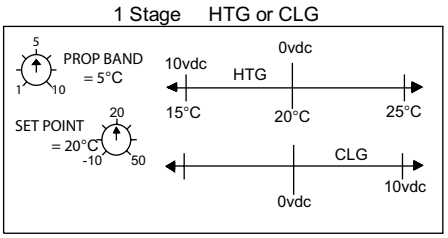
ACCESSORIES:

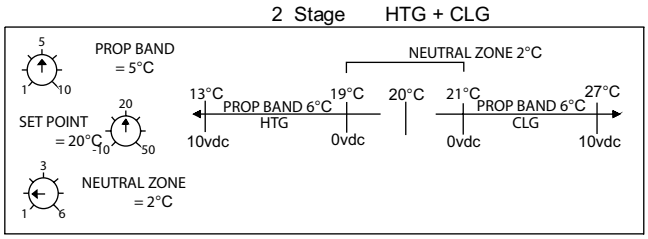
EE-2B ½" BSP x 120mm Brass pocket for ETC-I..

EE-STK ½" BSP x 120mm Stainless Steel pocket for ETC-I..



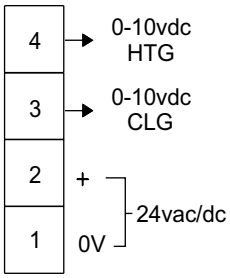
WIRING:





WIRING:

ETC..



INSTALLATION: Terminals 0.5-2.5mm² Max length 100m. Sensor cable size 7/0.2mm Screened cable is recommended. Keep away from power cables/units which may cause interference. The screen should be earthed at the controller end only .

TEMPERATURE CONTROLLERS 0-10VDC

PROPORTIONAL/INTEGRAL 1,2 OR 3 OUTPUTS

E15-PTL...

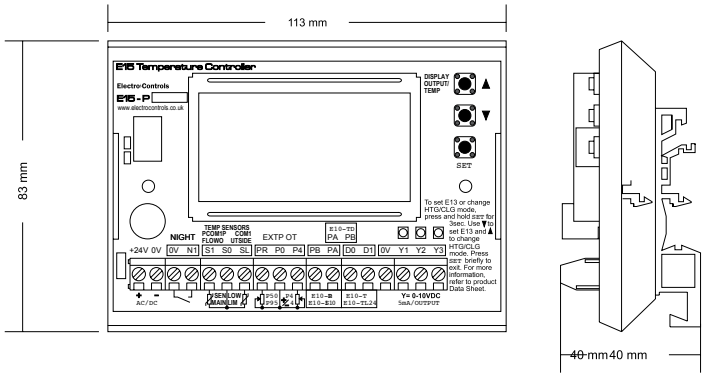
The E15 Temperature Controller is a fully digital controller which has 1, 2 or 3 0-10VDC proportional outputs. Integral, Low Limit and Night Setback is standard. Night Setback is via external time switch (not provided). A clear LCD display is provided to guide the user through set up and verification.
Temperature Sensors from the E10 family should be selected and accessories such as a Digital Set Point Adjuster, Digital Display and Room Sensors are available. This product is compatible with the functions and accessories of the E13 family. See the Accessories section of this data sheet for more information.

Temperature range	-10 to +95°C
Proportional band	0.5 to 50°C
Dead Band	0 to 15°C
Integral time	0 to 500 seconds
Low limit setting	0 to 30°C
Night setback	0 to 40°C (Ext. Time Switch)
Temp. Resolution	0.5°C
Power supply	24VAC/DC +/-15%
Power Consumption	2VA (without accessories)
IP rating	IP00

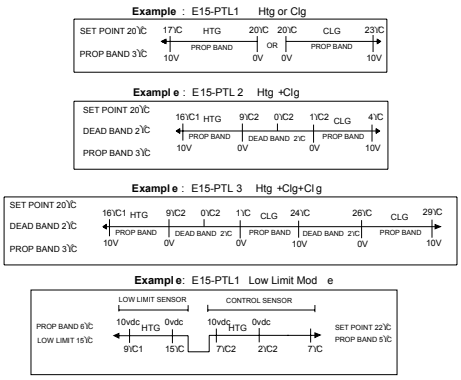
Type	Outputs	Functions	Mounting	Protection
E15-PTL1	1 x 0-10VDC	HTG or CLG	Din Rail	IP00
E15-PTL2	2 x 0-10VDC	HTG + CLG HTG + HTG or CLG +CLG	Din Rail	IP00
E15-PTL3	3 x 0-10VDC	CLG + CLG + CLG HTG + CLG + CLG HTG + HTG + CLG HTG + HTG + HTG	Din Rail	IP00

Note: If Low Limit Sensor is connected, only one Heating output will be available

DIMENSIONS/TERMINATION:



EXAMPLE TEMPERATURE DIAGRAMS:



SET UP:

Turn on the controller. Momentarily the display will show all the screen characters then the Product mode E 15 P1, E 13 P1 or E 13 P4 (only available in the E15-PTL1).
Press and hold the **SET** button for 3 seconds. The **SET CONTROL MODE**: will be displayed. Press the ▼button to toggle between the E15 and E13, and ▲button repeatedly to change the HTG/CLG mode required. Press **SET** to confirm the selection.
Briefly press **SET** repeatedly to select the required parameters i.e. SET POINT, PROP BAND, DEADBAND, INTEGRAL, LOW LIMIT, LOW LIMIT PROP BAND (if Low Limit Sensor is connected) and NIGHT SETBACK. The ▲▼ buttons can be used to set numerical value required.
Whilst setting the parameters, if the buttons are left for 10 seconds, the screen will return to the Temperature screen.
In the Temperature screen use ▲▼ buttons repeatedly to show TEMPERATURE LOW LIMIT (if Low Limit Sensor is connected), OUTPUT Y1%, Y2% and Y3%.

Reverting to the default settings

Start with the power off.
Hold the ▲button down whilst turning on the power.
LOD EF and DEF LO will be displayed.
Turn off the power and turn on again. The controller will now be in its normal state.

Diagnostic messages

ERR S1 Main Sensor short circuit or not connected.
ERR SL Low Limit Sensor short circuit.

ACCESSORIES: See the table below for the valid accessories:

Accessory type	Accessory Part number	Selected product mode	
		E15-P1/2/3	E13-P1/2/3/4*
Temperature sensors	E10-B/C/D/DA/G/H/I/K/R/RA/S/V/X	✓	✓
Set Point adjuster	E10-P4,E10-P50 and E10-P95 (E13-P4 mode only)		✓
Digital Set Point Adjuster	E10-S110	✓	
Digital Room sensor	E10-RD	✓	
Analogue display	E10-T		✓
Digital Display	E10-TD	✓	
Enclosure	EE-M2T	✓	✓

* E13-P4 mode is only available in the E15-PTL1. The E13-PO4 and E13-PT4 are compatible with the E15-PTL1.

INSTALLATION: Sensor cable size 7/0.2mm.Screened cable is recommended with a maximum length of 100metres and earthed at the controller end only. Route all cables away from other power cables or devices which may cause interference.

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E14 TEMPERATURE CONTROLLER 0-10VDC PRODUCT SELECTION GUIDE

E14...

The E14 Temperature controller is a fully digital controller which can be configured with 1, 2 or 3 0-10VDC outputs and other features such as proportional + integral control and low limit. Night setback is standard.

A clear lcd display is provided to guide the user through set up and verification. The product is totally enclosed to IP54 as standard.

Temperature sensors from the E10 family should be selected and accessories such as a Digital Setpoint Adjuster and Digital Display are available for use with the E14.

E14-P..

SELECTION GUIDE:

Basic controller with proportional control and a single 0-10VDC output	**E14-P1**	Htg or Clg
With additional outputs 2 off 0-10VDC outputs	**E14-P2**	Htg+Clg or Htg+Htg or Clg+Clg
3 off 0-10VDC outputs	**E14-P3**	Htg+Htg+Htg or Htg+Htg+Clg or Clg+Clg+Clg or Htg+Clg+Clg
With proportional + integral control for	**E14-P1I**	Htg or Clg
	E14-P2I	Htg+ Clg or Htg+Htg or Clg+Clg
	E14-P3I	Htg+Htg+Htg or Htg+Htg+Clg or Clg+Clg+Clg or Htg+Clg+Clg
With Low Limit temperature control	**E14-P1LL**	Htg only
	E14-P2LL	Htg + Clg
	E14-P3LL	Htg + Clg + Clg

Add the sensors required-see page ……..

Add the accessories

Digital Set point adjuster	**E10-S110**
Digital Display	**E10-TD**
Room Sensor	**E10-RD**
Compensator version	**E14-PCOM1**

Add the sensors required (two)

Add the accessories

Digital flow setpoint adjuster

TEMPERATURE CONTROLLERS 0-10VDC

TEMPERATURE CONTROLLER 0-10VDC

E14-P..

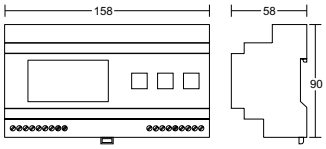
The E14 Temperature controller is a fully digital controller which can be configured with 1, 2 or 3 0-10VDC outputs and other optional features such as proportional + integral control and low limit. Night setback is standard (time switch not provided).

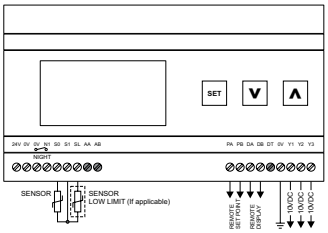
A clear lcd display is provided to guide the user through set up and verification. The product is totally enclosed to IP54 as standard.

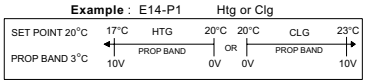
Temperature sensors from the E10 family should be selected and accessories such as a Digital Setpoint Adjuster and Digital Display and Room Sensor are available for use with the E14.

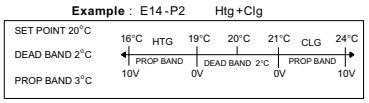
Supply	24VAC/DC
Temp range	-20 to 110deg C
Temp resolution	0.1deg C
Prop band	1 to 15degC
Dead band	0 to 10degC
Integral time	0 to 300s (E14-P..I only)
Output	1,2 or 3 x 0-10VDC
Output resolution	0.1VDC
Night setback range	-20 to 110 deg C
IP rating	IP54

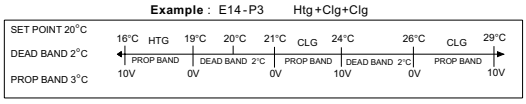
DIMENSIONS AND WIRING:

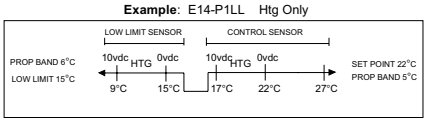












Sensor cables should be screened cable 7/0.2 mm max length 100m with the screen earthed at the controller end only.

SETTINGS:

Setting the Control mode

Whilst holding the ▼ push button turn the power on.
The display will show SET and CONTROL MODE.
Use the ▲ ▼ to scroll through the modes and confirm with the SET push button the mode required.
The controller will then begin to operate normally

Setting of Set Point, Proportional band etc

With the temperature indication displayed press the SET push button to step through the desired parameters and the value can be set using the ▲ and ▼ buttons.
By repeatedly pressing the SET button the parameters of:
SET POINT
PROPORTIONAL BAND Y1
PROPORTIONAL BAND Y2 (if applicable)
PROPORTIONAL BAND Y3 (if applicable)
DEADBAND Y1Y2 and Y2Y3 (if applicable)
INTEGRAL TIME (if applicable)
LOW LIMIT
LOW LIMIT PROPORTIONAL BAND
NIGHT SETBACK
can be set up.
After 10s the E14 will come out of the setting menu and operate normally.

Viewing the output data

With the temperature displayed press the ▲ to see the output of Y1displayed. Press the ▲ again for display of the Y2 output (if applicable) and press the ▲ a third time for display of the Y3 output (if applicable).
DC output values are shown in %. i.e 10VDC is 100%
This display will be maintained until the ▲ is pressed after the last output display after which the temperature will be displayed.

Reverting to default settings

Start with the power OFF
Hold the ▲ pushbutton down whilst turning on the power.
LoD and deFLd will be displayed followed by the display of temperature.
Turn off the power and turn on again.The controller will now be in its normal state.
More detailed instructions are shown on the Product Data sheet supplied with the product.

ACCESSORIES

E10…… Temperature sensor Select the type of sensor needed from the E10 range shown on page…….
E10-S110 Digital Setpoint adjuster
E10-TD Digital remote temperature display

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COMPENSATOR 0-10VDC FOR BOILERS OR MIXING VALVES

E14-PCOM1

- This compensator can be used to adjust boiler flow temperature in relation to changes in outside temperature.

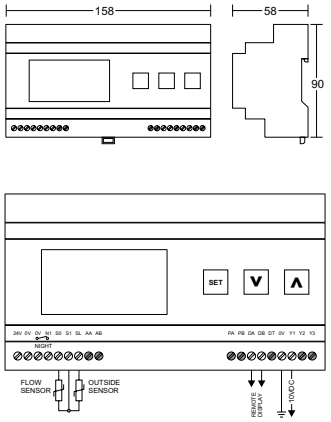
  The 0-10VDC output can be used to modulate an actuator/mixing valve.

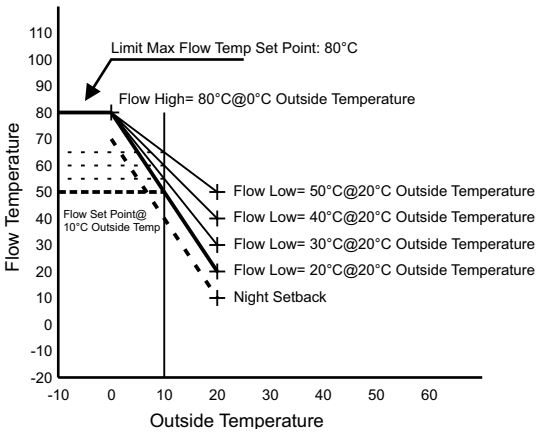
  Alternatively the 0-10VDC signal can be wired to a relay interface unit (E4RM for example) to switch several boilers in sequence.

This compensator must be used with an outside temperature sensor and a flow temperature sensor.

Supply	24VAC/DC
Temp range	-20 to 110 degC
Temp resolution	0.1deg C
Prop band	1 to 40degC
Integral time	0 to 300s
Output	0-10VDC
Output resolution	0.1VDC
IP rating	IP54

DIMENSIONS AND WIRING





Sensor cables should be screened cable 7/0.2mm max length 100m with the screen earthed at the controller end only.

SETTINGS:

Setting the Control mode

Whilst holding the ∨ push button turn the power on.
The display will show SET and CONTROL MODE.
Use the ∧/∨ to scroll through the modes and confirm with the SET push button the mode required.
The controller will then begin to operate normally.

Setting of Flow temperatures, Proportional band etc

With the temperature indication displayed press the SET push button to step through the desired parameters and the value can be set using the (up arrow) and ∨ buttons.
By repeatedly pressing the SET button the parameters of:
SET POINT CALCULATED (display only)
PROPORTIONAL BAND Y1
INTEGRAL TIME
FLOW HIGH
FLOW LOW
NIGHT SETBACK
Can be displayed and set up
After 10s the display will revert to the temperature indication.
Note: the set point does not have to be set up because this is calculated from the Flow low and Flow high.
The night setback is an offset subtracted from the calculated set point.

Viewing the output data

With the temperature displayed press the ∧ and the following temperatures will be displayed.
TEMP FLOW
TEMP OUTSIDE
Y1
The DC output value is shown in %. i.e 10VDC is 100%
This display will be maintained until the ∧ is pressed after which the temperature will be displayed again.

Reverting to default settings

Start with the power OFF
Hold the ∧ pushbutton down whilst turning on the power.
LoD and deFLd will be displayed followed by the display of temperature.
Turn off the power and turn on again. The controller will now be in its normal state.
More detailed instructions are shown on the Product Data sheet supplied with the product.

ACCESSORIES

E10-X	Outside temperature sensor
E10-I	Immersion temperature sensor
E10-TD	Digital remote temperature display

Note: The E10-S110 Digital Setpoint adjuster is not available with the E14-PCOM1

DIGITAL DISPLAYS

TRANSMITTER DISPLAY 0-10VDC M/S - MBAR - BAR - %RH - C - KPA - PA ETC

EDIG-2

These products are Front Panel mounted and can be used to display the sensed parameter by receiving a 0-10vdc input from Pressure, Temperature, Humidity, Flow, Level transmitters and damper/valve motors.
The display and transmitter range must be matched. Otherwise use the 0 -10 or 0-100 display range.The display will be linear across the input range.

EDIG-2

Accuracy approx 1% of range.

Suitable for use with EDT.. EWT.. EWPT.. EAV.. EHDT.. EHRT.. ED-V040 EI-V110 E08..M E16..M etc.

The ranges are selected via a 16 position switch.

Input current < 0.5mA
Enclosure Flammability = UL94-V2

Type	Selectable Display	Selectable Range	Supply	Input	Power Consumption	Mounting	Enclosure
EDIG-2	C %RH m/s mbar Bar kPa Pa etc	See chart	24VAC/DC	0-10VDC	<3.3VA	Front Panel	IP00

RANGE CHART:

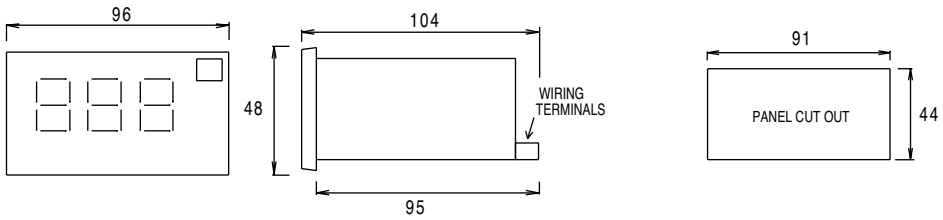
Switch Position	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Display Range	0-1	0-2	0-3	0-5	0-10	0-16	0-25	0-50	0-100	0-200	0-500	0-999	-10/+40	-10/+110	-10/+50	25/95

Example: If the range required is 0-100 mbar, then set the switch position to 8.
At 0vdc input, the display is zero and linear up to 10vdc, when the display will be 100 mbar

THIS PRODUCT CAN ALSO BE USED AS A POSITION INDICATOR FOR 0-10VDC DAMPER / VALVE MOTORS.

DIMENSIONS

EDIG-2

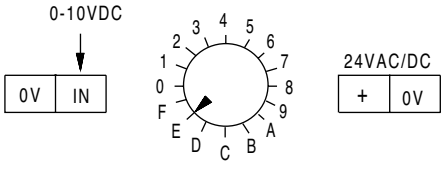


Fixing brackets & screws are provided.
A set of labels are included with the following symbols and can be applied to the unit as shown above -

kPa | mbar | Pa | m/s | bar | %RH | C

WIRING:

EDIG-2



Rotary switch to select the range required.

INSTALLATION: Terminals 0.5-2.5mm Sensor / control signal cable size 7/0.2mm Max length 100m
Screened cable is recommended The screen should be earthed at controller end only
Keep sensor/control signal wires away from power cables/units which may cause interference.

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TRANSMITTER DISPLAY 0-10VDC WITH SET POINT SWITCH

EDIG-4

This unit accepts a 0-10VDC signal from Pressure, Temperature, Humidity, Flow or Level transmitters and Damper / Valve motors. The display indicates the sensed parameter which is linear across the range. A setpoint and differential can be adjusted to switch a volt free contact. The range of the transmitter must match the display range. Otherwise use the 0-10 or 0-100 display range.

EDIG-4

Accuracy approx 1% of range.

Suitable for use with EDT.. EWT.. EWPT.. EAV.. EHDT.. EHRT.. ED-V040 EI-V110 E08..M E16..M etc.

The ranges are selected via a 16 postion switch.

Input current < 0.5mA
Enclosure Flammability = UL94-V2

Type	Selectable Display	Selectable Range/Setpoint	Diff Adj	Supply +-15%	Input	230VAC SPDT	Power Consumption	Mounting	Enclosure
EDIG-4	C %RH m/s mbar Bar kPa Pa etc	See chart	See chart	24VAC/DC	0-10VDC	10(3) A	<3.3VA	Front Panel	IP00

RANGE CHART:

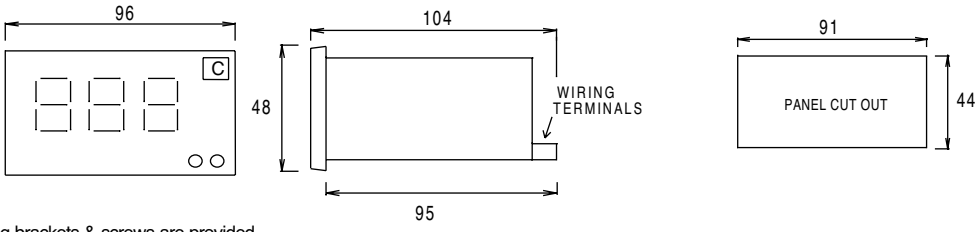
Switch Position	0	1	2	3	4	5	6	7	8	9
Display Range	0-1	0-2	0-3	0-5	0-10	0-16	0-25	0-50	0-100	0-200
Diff adj.	0.1-0.9	0.1-1.9	0.1-2.9	0.1-4.9	0.1-9.9	0.1-15	0.1-24	0.5-49	1-99	1-199

Switch Position	A	b	C	D	E	F
Display Range	0-500	0-999	-10 / +40	-10 / +110	-10 / +50	25/95
Diff adj.	1-499	1-900	0.5-40	0.5-40	0.5-40	0.5-40

Example:
If the range required is 0-100mbar, set the switch position to 8. At 0vdc input, the display is zero and linear up to 10vdc, when the display will be 100mbar. The switch point & differential is adjustable

DIMENSIONS

EDIG-4



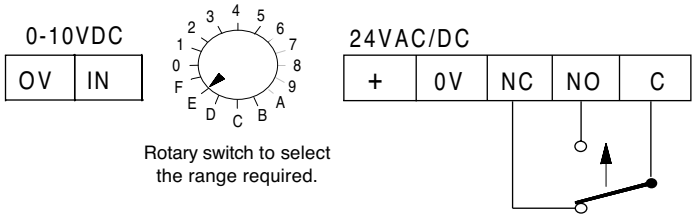
Fixing brackets & screws are provided.

A set of labels are included with the following symbols and can be applied to the unit as shown above - kPa | mbar | Pa | m/s | bar | %RH | C

ADJUSTMENT: Press either button on the front panel and the current Setpoint is displayed. Adjust to the required value by pressing the buttons (left =decrease, right = increase) The Diff is then displayed which can also be adjusted in the same way, if required. After the adjustments have been made, the sensed parameter will be displayed automatically.

WIRING:

EDIG-4



Rotary switch to select the range required.

On increase to the setpoint C-NC makes
On decrease (diff) C-NO makes

INSTALLATION: Terminals 0.5-2.5mm Sensor / control signal cable size 7/0.2mm Max length 100m
Screened cable is recommended The screen should be earthed at controller end only
Keep sensor/control signal wires away from power cables/units which may cause interference.

THYRISTOR CONTROLS

THYRISTOR CONTROLS SINGLE PHASE 0-10VDC

EY1..

These thyristor controls accept 0-10vdc input signals from temperature controllers to regulate the current flow to electric heaters or other resistive loads in order to achieve accurate proportional control. The unit operates on the burst fire zero voltage switched principle. Zero voltage switching for minimum RFI. Burst firing for minimum harmonic distortion. The full load is switched on & off in timed bursts and is proportional to the input signal.

EY1-1.5

EY1-3 / EY1-7 / EY1-12

For other voltages DO NOT exceed the fuse rating.

The EY1-1.5 does not have an internal fuse. A high speed semi-conductor fuse should be fitted externally.

All other units have fast semi-conductor fuses to protect against short circuit & overload.

Max. ambient is 40°C - derate 20% at 50°C.

Aluminium body with cooling fins.

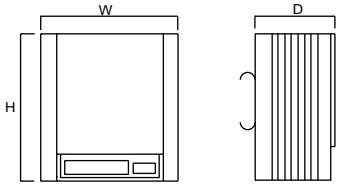
Metal cover

Type	Phase	Max Heater Duty kW	Supply VAC	Supply Hz	Internal Fuse	Dissipated Heat (Watts)	Load	Mounting	Protection
EY1-1.5	1	1.5	230	50/60	-	1.5 x load current	>100KΩ	Din Rail	IP00
EY1-3	1	3.5	230	50/60	20A	1.5 x load current	>100KΩ	Din Rail	IP00
EY1-7	1	7.0	230	50/60	35A	1.5 x load current	>100KΩ	Din Rail	IP00
EY1-12	1	12.5	230	50/60	100A	1.5 x load current	>100KΩ	Bracket	IP00

Ensure unit is adequately ventilated to dissipate internally generated heat.
For use with 0-10vdc temperature controllers - see separate data sheet.

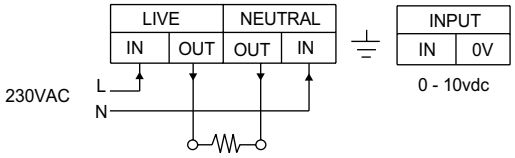
DIMENSIONS

Type	H	W	D	Weight (Kg)
EY1-1.5	82	90	50	0.14
EY1-3	150	90	65	0.64
EY1-7	150	102	102	1.15
EY1-12	200	112	146	2.19



WIRING:

EY1..



For Normal use the MAN/AUTO link should be on AUTO

On 0-10vdc input, both the ground (OV) & signal wires must be connected. If the input signal is cut the thyristor output will be zero. During long 'off ' periods the power supply to the thyristor should be turned off. Heaters should be protected with a high temp cut-out. Select a thyristor allowing for heater battery & supply voltage tolerances which may cause the current to increase by approx 20%. Note the fuse ratings. One internal fuse is fitted to protect the thyristor only. All cables & external fuses must be fitted according to local regulations & safety requirements.

Load terminal size: EY1-1.5 / EY1-3 1.5mm² EY1-7 2.5mm² EY1-12 10mm² Input signal terminal size 0.5-2.5mm²

Min sensor / control signal cable size 7/0.2mm Max length 100m. The screen should be earthed at controller end only.
Keep sensor/control signal wires away from power cables/units which may cause interference. Screened cable is recommended.

INSTALLATION: Allow 25mm clearance on horizontal axis & 100mm on vertical axis between units. Air must be allowed to flow freely through the unit.
Fit grilles or louvres to the top & bottom of any enclosures.
Install with the cooling fins vertically - Forced ventilation may be necessary. Do not exceed the maximum ambient temperature.

FAULT FINDING: Check the 0-10Vdc input ground & signal wires are in the correct terminals.
If the internal fuse is blowing : Check the fuse rating & ensure the fuse is screwed down tightly.
Check all terminals & wiring connections are TIGHT. Loose connections can cause bad contact/arcing or the terminal to overheat.
Check electric heater or load rating. Check other units which may cause excessive current to be drawn.
Check for short circuit on wiring or heater. Check supply voltage variations.

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THYRISTOR CONTROLS 3 PHASE 0-10VDC

EY3..

These thyristor controls accept 0-10vdc input signals from temperature controllers to regulate the current flow to electric heaters or other resistive loads in order to achieve accurate proportional control. The unit operates on burst fire zero voltage switched principle. Zero voltage switching for minimum RFI. Burst firing for minimum harmonic distortion. The FULL load is switched on & off in timed bursts and is proportional to the input signal.

EY3..

For other voltages DO NOT exceed the fuse rating.

Fitted with fast semi-conductor fuses to protect against short circuit & overload.

Max. ambient is 40°C - derate 20% at 50°C.

Aluminium body with cooling fins.

Metal cover

Ensure unit is adequately ventilated to dissipate internally generated heat.

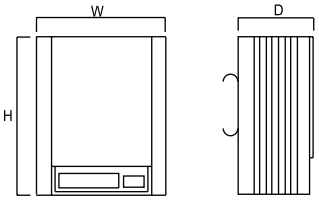
Load > 100KΩ.

Type	Phase	Max Heater Duty kW	Supply VAC	Supply Hz	Internal Fuse	Dissipated Heat (Watts)	Thermal Cut-Out	Mounting	Protection
EY3-10	3	10	415	50/60	20A	3 x load current	-	Din Rail	IP20
EY3-20	3	20	415	50/60	50A	3 x load current	-	Din Rail	IP20
EY3-28	3	28	415	50/60	100A	3 x load current	-	Din Rail	IP20
EY3-36	3	36	415	50/60	100A	3 x load current	-	Din Rail	IP20
EY3-54	3	54	415	50/60	100A	3 x load current	In built	Bracket	IP20
EY3-86	3	86	415	50/60	2x100A	3 x load current	In built	Bracket	IP20
EY3-105	3	105	415	50/60	315A	3 x load current	In built	Bracket	IP20
EY3-150	3	150	415	50/60	315A	3 x load current	In built	Bracket	IP20

For use with 0-10vdc temperature controllers - see separate data sheet. Replacement fuses available on request.

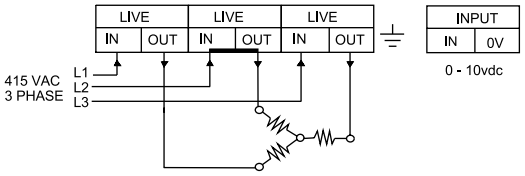
DIMENSIONS

Type	H	W	D	Weight (Kg)	Type	H	W	D	Weight (Kg)
EY3-10	150	150	63.5	1.0	EY3-54	200	265	160	6.39
EY3-20	150	150	88	1.49	EY3-86	200	265	160	6.99
EY3-28	150	153	126	2.29	EY3-105	250	265	160	8.69
EY3-36	200	265	160	6.39	EY3-150	230	345	242	16.00

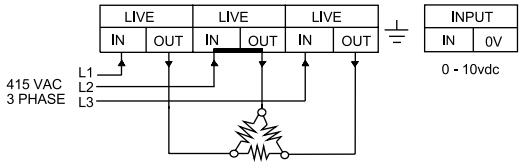


WIRING:

STAR



DELTA



For Normal use the MAN/AUTO link should be on AUTO. In MANUAL the potentiometer is used to regulate the output.

No mains neutral connection should be made to the heater. L1 & L3 switch the current to the heater. L2 is permanently connected.
The load must be split EQUALLY on all phases. During long 'off' periods the power supply to the thyristor should be turned off.
Heater batteries should be protected with a high temperature cut-out.
On 0-10vdc input both the ground (OV) & signal wires must be connected. If the input signal is cut the thyristor output will be zero.

Select a thyristor **allowing** for heater battery & supply voltage tolerances which may cause the current to increase by approx 20%.
Note the fuse ratings. Two internal fuses are fitted to protect the thyristor only.
Min sensor / control signal cable size 7/0.2mm. Max length 100m. Two screen should be earthed at controller end only.
Keep sensor/control signal wires away from power cables/units which may cause interference. Screened cable is recommended.
All cables & external fuses must be fitted according to local regulations & safety requirements. Input signal terminals 0.5-150mm²

Load terminal sizes :
EY3-10 – 1.5mm² EY3-20 – 2.5mm² EY3-28 – 4mm² EY3-36 – 10mm²
EY3-54 – 16mm² EY3-86 – 25mm² EY3-105 – 35mm EY3-150 – 70mm²

INSTALLATION:

Allow 25mm clearance on horizontal axis & 100mm on vertical axis between units. Air must be allowed to flow freely through the unit.
Fit grilles or louvres to the top or bottom of any enclosures.
Install with cooling fins vertically - Forced ventilation may be necessary. Do not exceed the maximum ambient temperature.

FAULT FINDING:

Check the 0-10Vdc input ground & signal wires are in the correct terminals.
If the internal fuse is blowing : Check the fuse rating & ensure the fuse is screwed down tightly.
Check all terminals & wiring connections are TIGHT. Loose connections can cause bad contact/arcing or the terminal to overheat.
Check electric heater or load rating. Check other units which may cause excessive current to be drawn.
Check for short circuit on wiring or heater. Check supply voltage variations.

FAN SPEED CONTROLS

MOTOR SELECTION GUIDE FOR FAN SPEED CONTROLS

When selecting a control to operate the speed of fan or pump motors, it is essential to consider a number of important factors. The data herein is only a brief overview. It is not intended to provide the full technical details on the selection of fans or motors. To avoid doubt the fan or motor manufacturer should be consulted for guidance.

FAN SPEED CONTROLS

MTY..	Potentiometer	1 Phase Fans	Manual Control
STL..	Potentiometer	1 Phase Fans	Manual Control
EVS..	0-10VDC Input	1 Phase Fans	Automatic Control
STR..	Transformer	1 Phase Fans	5 Step Manual Control
STR4..	Transformer	3 Phase Fans	5 Step Manual Control

Fan Speed Controls are also available for use with:
- Motors with TK thermal cut-out.
- Differential Pressure Transmitters.
- Temperature Operated.

FAN SUITABILITY

Propeller, Centrifugal and Axial.

FAN MOTOR SELECTION

Motors must be capable of running at reduced speeds and voltages.
Suitable types are split capacitor, shaded pole and 6 or 8 pole motors.
4 pole motors are most suitable as they operate over a wider control range.
2 pole motors are difficult to control <600 rpm and have poor starting performance at reduced voltages.
(This may not be problem when the 5 step fan speed controller is used)
High resistance rotors are ideal and give more stable linear characteristics.
These fan speed controls are generally not suitable for pump motor control.

TEMPERATURE

Use Class F rated rotor windings which can withstand temperatures up to 155°C.
Running at low speeds can increase the motor temperature. Motors should be air cooled.
A larger frame size may be necessary to dissipate the extra heat generated when running at low speeds.
Motor thermal protection is recommended.
The fan speed controls are rated at 30°C ambient. The nominal current should be de-rated by 2% per 1°C increase up to a max of 40°C.

LOAD PERFORMANCE

The motor size should be matched to the impeller load.
Optimum speed control is achieved when the motor load absorbs at least 75% of the rated nominal motor power when running at full speed.
The fan speed control nominal current should be greater than the nominal motor running current.
Several motors can be wired to one fan speed control but the current limits must not be exceeded.
Note that the running current on most motors can increase by approx 20% when the speed is reduced

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FAN SPEED CONTROLS 230VAC 1 PHASE MANUAL OPERATION

MTY.. STL..

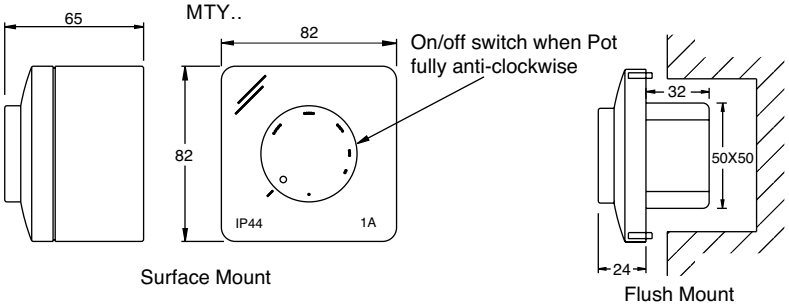
These electronic controls are used to manually adjust the speed of motors via a max - min adjusting knob on the front which reduces/increases the supply voltage to the motor. Before selecting a control its compatibility must be ensured. Please read the Motor Selection Guide on a separate data sheet.

When the unit is switched on and also when power is re-applied (with the speed control switch already in the on position), it will run up to the speed that is set by the potentiometer position.

Type	Nominal Current	Supply 50-60Hz	Fast Blow Fuse Type "F" Fitted	Start Sequence	Manual Speed Adjustment	Mounting	Enclosure
MTY-0-05-AT	0.5A	230Vac	630mA	Pot Position	Internal pot	Surface and flush	IP44
MTY-0-10-AT	1A	230Vac	1.25A	Pot Position	Internal pot	Surface and flush	IP44
MTY-0-20-AT	2A	230Vac	2.5A	Pot Position	Internal pot	Surface and flush	IP44
MTY-0-40-AT	4A	230Vac	5A	Pot Position	Internal pot	Surface	IP54
STL-0-15-AT	1.5A	230Vac	3A	Pot Position	Internal pot	Surface	IP54
STL-0-30-AT	3A	230Vac	5A	Pot Position	Internal pot	Surface	IP54
STL-0-50-AT	5A	230Vac	8A	Pot Position	Internal pot	Surface	IP54
STL-0-60-AT	6A	230Vac	8A	Pot Position	Internal pot	Surface	IP54
STL-0-100-AT	10A	230Vac	14A	Pot Position	Internal pot	Surface	IP54

Minimum Speed can be set via the internal trim potentiometer. The maximum current is based on max ambient of 30 C. Enclosure : Plastic.
Several motors can be connected at once as long as the speed control's maximum current is not exceeded. Suitable for 2 or 3 wire motors.
The Speed Control's maximum current must be just larger than the nominal motor running current. Start current can be 3 x nominal current.

DIMENSIONS



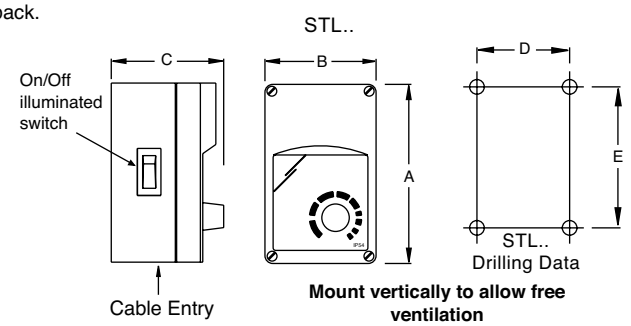
Surface Mount

Flush Mount

Electrical entry is possible from the bottom or from the back.

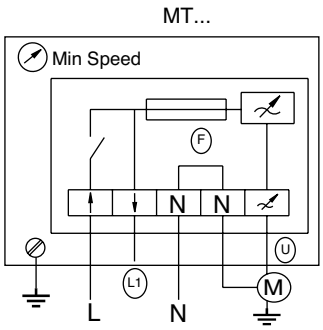
THE POT ON STL.. CAN BE REMOVED FOR FRONT PANEL MOUNTING

	STL-0-15-AT	STL-0-30-AT	STL-0-50-AT	STL-0-60-AT	STL-0-100-AT
kg	0.325	0.350	0.440	0.650	0.710
A	160			195	
B	83			115	
C	88			95	
D	71			98	
E	108			140	



Mount vertically to allow free ventilation

WIRING:



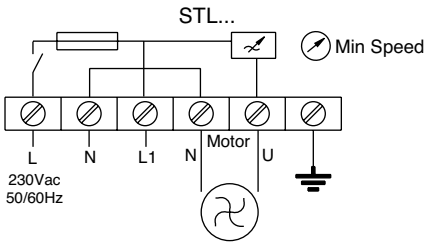
L - Live supply via On/Off switch: 230Vac

F- Fuse-box with spare fuse (Ceramic, Type "F")

L- Controlled live output to motor

L1- Non controlled live output 230Vac for 3 wire motors, or it can be used as a live supply to the controller, bypassing the On/Off switch which is incorporated in the turning knob/potentiometer.

All cables, isolators & external fuses must be fitted according to local regulations, safety & motor manufacturers requirements.



L1 : Live supply bypassing the Fuse & On/Off switch (which is on the side) or it can be used as a supply for 3 wire motors.

FAN SPEED CONTROLS

FAN SPEED CONTROLS 230VAC 1 PHASE 0-10VDC INPUT

EVS..

These units accept 0-10vdc input signal and control the voltage output to a fan motor. As the 0-10vdc signal increases or decreases the motor speed operates respectively. Before selecting a control its compatibility must be ensured. Please read the Motor Selection Guide on a separate data sheet.

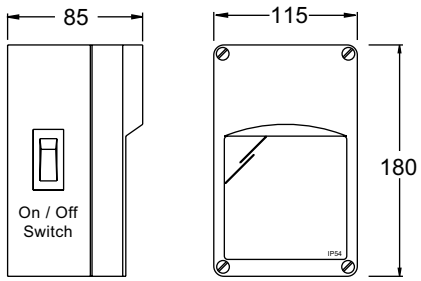
Suitable for 2 or 3 wire motors
Minimum Speed can be set via the internal trim potentiometer
Enclosure : Plastic
Unit can be switched on/off via the illuminated switch on the side
Start current can be 3 x nominal current.
Several motors can be connected at once as long as the speed control's maximum current is not exceeded. The maximum current is based on a maximum ambient temperature of 30 C.

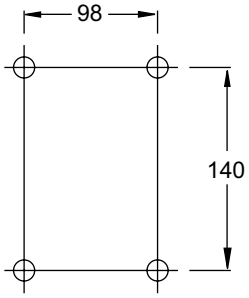
Type	Nominal Current	Supply 50-60Hz	Fast Blow Fuse Type "F" Fitted	Input Signal	Start Sequence Adjustment	Min Speed Adjustment	Mounting	Enclosure
EVS-0-15-DT	1.5A	230Vac	3A	0-10VDC	As input signal	Via internal pot	Wall	IP54
EVS-0-30-DT	3A	230Vac	3A	0-10VDC	As input signal	Via internal pot	Wall	IP54
EVS-0-60-DT	6A	230Vac	6A	0-10VDC	As input signal	Via internal pot	Wall	IP54
EVS-0100-DT	10A	230Vac	14A	0-10VDC	As input signal	Via internal pot	Wall	IP54

The selected Speed Control's maximum current must be just larger than the nominal motor running current.
When the input signal is cut, the unit reverts to the minimum speed set via the trim pot. Factory set at 100VAC.
If the trim pot is set to 0, the fan speed will be zero.

DIMENSIONS

EVS..



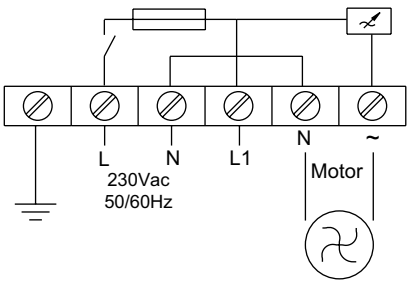


Drilling Data

Mount vertically to allow free ventilation around the unit

MODEL	EVS-0-15-DT	EVS-0-30-DT	EVS-0-60-DT	EVS-0100-DT
WEIGHT(kg)	0.69	0.740	0.900	0.900

WIRING:



L - Live supply via On/ Off switch & fuse
L1 - Live supply bypassing the On/Off switch & fuse or it can be used as a supply for 3 wire motors.

SETTINGS:

Dip switches

16	Input voltage	down	0-10VDC
		up	10-0VDC
17	Off level	down	disable off level
		up	enable off level
18	Kick start	down	disable kick start
		up	enable kick start
19	Current/Voltage Selection	down	4-20mA
		up	0-10VDC

Potentiometers

20	Level adjustment	0-4V or 10-6V depending on Switch 16 selection
21	Min speed adjust	60-160V
22	Max speed adjust	165-230V

All cables, isolators & external fuses etc must be fitted according to local regulations, safety & motor manufacturers requirements.

Min Sensor / control signal cable size 7/0.2mm Max length 100m. The screen should be earthed at control end only.
Keep sensor / control signal wires away from power cables/units which may cause interference. Screened cable is recommended.

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FAN SPEED CONTROLS 230VAC 1 PHASE 5 SPEED MANUAL OPERATION

STR..

These transformer controls vary the speed of fan motors via a 1-5 step manual selector knob on the front which decreases or increases the supply voltage to the motor. Before selecting a control its compatibility must be ensured. Please read the Motor Selection Guide on a separate data sheet.

Suitable for 2 or 3 wire motors

Power-On Lamp

Internal fast blow fuse “F” type

Start current can be 3 x nominal current.

When the unit is switched on and also when power is re-applied (with the speed control switch already in the on position), it will run up to the speed that is set by the knob position. The maximum current is based on max ambient of 30oC.

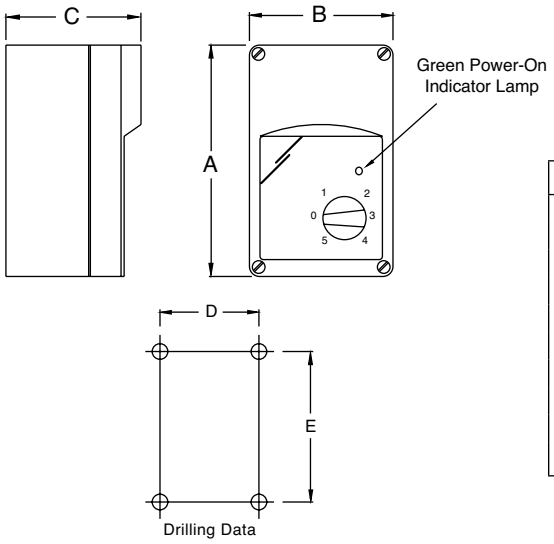
The selected Speed Control’s maximum current must be just larger than the nominal motor running current.

Several motors can be connected at once - do not exceed the speed control’s current rating.

Type	Nominal Current	Supply 50-60Hz	Fast Blow Fuse “F” 5x20	Fast Blow Fuse “F” 6x32mm	Start Sequence	Manual Speed Adjustment	Mounting	Case	Enclosure
STR-1-08L22	0.8A	230Vac	1,5A	-	Knob Position	5 Step	Wall	Plastic	IP54
STR-1-15L22	1.5A	230Vac	2A	-	Knob Position	5 Step	Wall	Plastic	IP54
STR-1-22L22	2.2A	230Vac	2.5A	-	Knob Position	5 Step	Wall	Plastic	IP54
STR-1-35L22	3.5A	230Vac	5A	-	Knob Position	5 Step	Wall	Plastic	IP54
STR-1-50L22	5A	230Vac	8A	-	Knob Position	5 Step	Wall	Plastic	IP54
STR-1-75L22	7.5A	230Vac	10A	-	Knob Position	5 Step	Wall	Plastic	IP54
STR-1100L22	10A	230Vac	-	14A	Knob Position	5 Step	Wall	Plastic	IP54
STR-1130L22	13A	230Vac	-	18A	Knob Position	5 Step	Wall	Plastic	IP54
STR-1160L22	16A	230Vac	-	25A	Knob Position	5 Step	Wall	Metal	IP54
STR-1200L22	20A	230Vac	-	30A	Knob Position	5 Step	Wall	Metal	IP54

DIMENSIONS

STR..

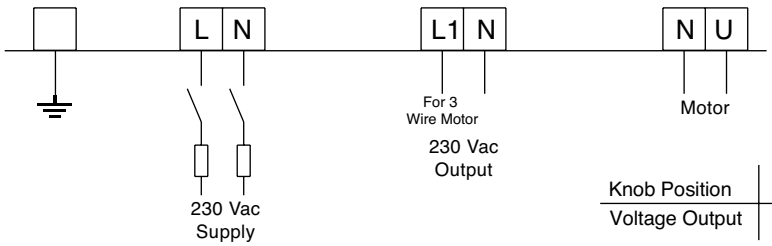


Mount vertically to allow free ventilation around the unit

	A	B	C	D	E	Weight(kg)
STR-1-08L22	180	115	85	98	140	1.4
STR-1-15L22	180	115	85	98	140	1.7
STR-1-22L22	180	115	85	98	140	2.5
STR-1-35L22	280	200	140	155	193	4.5
STR-1-50L22	280	200	140	155	193	4.9
STR-1-75L22	280	200	140	185	243	6.0
STR-1100L22	300	300	170	250	250	9.5
STR-1130L22	300	300	170	250	250	13
STR-1160L22	430	300	230	125	350	15
STR-1200L22	430	300	230	135	350	18

WIRING:

STR..



Knob Position	1	2	3	4	5
Voltage Output	80	110	140	170	230

All cables & external fuses must be fitted according to local regulations, safety and motor manufacturers requirements.

CAUTION: These products may be connected to 230VAC supply. The device should be checked by a qualified technician before applying any voltage.
Isolate device from electrical supply before removing cover. Observe all relevant safety precautions, wiring/earthing regulations & electrical ratings.
Observe design limits of temperatures and electrical ratings. Ensure all entry holes are completely sealed for all IP65/weatherproof models.
Always ensure the device operates at the correct electrical rating. If failure of the device can cause damage a safety backup control should be fitted.
All data is for guidance purposes only, subject to change without prior notice and not guaranteed to be absolutely correct unless confirmed by us in writing.

FAN SPEED CONTROLS

FAN SPEED CONTROLS 400VAC 3 PHASE 5 SPEED MANUAL OPERATION

STR-4-..

These transformer controls vary the speed of fan motors via a 1-5 step manual selector knob on the front which decreases or increases the supply voltage to the motor. Before selecting a controller its compatibility must be ensured. Please read the Motor Selection Guide on a separate data sheet.

STR-4-..

Suitable for 2 or 3 wire motors.

Start current can be 3 x nominal current.

Several motors can be connected at once as long as the speed controller's maximum current is not exceeded. The maximum current is based on a maximum ambient temperature of 30 C.

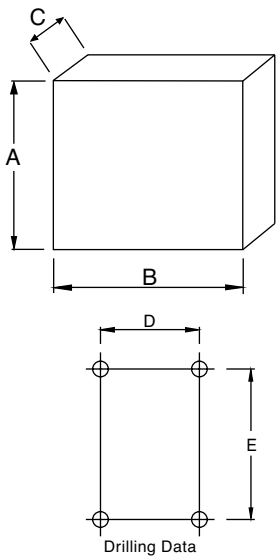
The selected Speed Controller's maximum current must be just larger than the nominal motor running current.

When the unit is switched on and also when power is re-applied (with the speed control switch already in the on position), it will run up to the speed that is set by the knob position.

Type	Nominal Current	Supply 50-60Hz	Start Sequence	Manual Speed Adjustment	Mounting	Case	Enclosure
STR-4-15L40	1.5A	400Vac	Knob Position	5 Step	Wall	Metal	IP54
STR-4-25L40	2.5A	400Vac	Knob Position	5 Step	Wall	Metal	IP54
STR-4-40L40	4A	400Vac	Knob Position	5 Step	Wall	Metal	IP54
STR-4-60L40	6A	400Vac	Knob Position	5 Step	Wall	Metal	IP54
STR-4-80L40	8A	400Vac	Knob Position	5 Step	Wall	Metal	IP54
STR-4-110L40	11A	400Vac	Knob Position	5 Step	Wall	Metal	IP54

DIMENSIONS

STR..



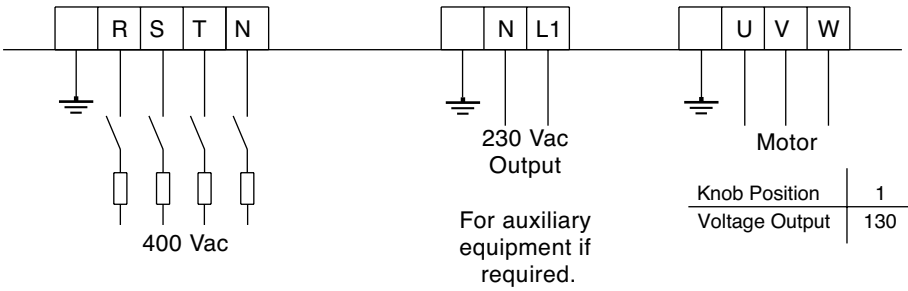
Drilling Data

Mount vertically to allow free ventilation around the unit

	A	B	C	D	E	Weight(kg)
STR-4-15L40	300	300	170	260	260	7
STR-4-25L40	300	300	170	260	260	9
STR-4-40L40	300	250	220	210	260	14
STR-4-60L40	400	300	220	260	360	20.5
STR-4-80L40	400	300	220	260	360	27.7
STR-4-110L40	430	400	270	360	360	31.7

WIRING:

STR..



For auxiliary equipment if required.

Knob Position	1	2	3	4	5
Voltage Output	130	180	230	300	400

All cables & external fuses must be fitted according to local regulations, safety and motor manufacturers requirements.

CAUTION: These products may be connected to 400VAC supply. The device should be checked by a qualified technician before applying any voltage.
Isolate device from electrical supply before cover. Observe all relevant safety precautions, wiring/earthing regulations & electrical ratings.
Observe design limits of temperatures and electrical ratings. Ensure all entry holes are completely sealed for all IP65/weatherproof models.
Always ensure the device operates at the correct electrical rating. If failure of the device can cause damage a safety backup control should be fitted.
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TEMPERATURE SENSORS FOR B.M.S

A range of NTC Thermistor, Ni1000 & PT100/PT1000 sensors for use with most manufacturers BMS equipment.

NTC /Ni
Sensors only suitable for up to 110°C

Enclosure Flammability:
ED, EF = UL94-V0
EI , EM, ES, EX = UL94-V0
ER, EV, EH = UL94-HB

EF / EJ.. Only suitable for use with PT100 sensors.

ALL SENSORS SUPPLIED WITHOUT LOGO

Prefix	Type	Dimensions	Protection
EC-	Cable	2m long cable. Sensor 7.1 dia x 40	IP65
ED-	Duct	80 dia x 55 160mm probe	IP65
EF-	Flue Gas	Probe length 230mm	IP65
EH-	Black Bulb	85H x 85W x 30D + bulb 16 mm	IP30
EI-	Immersion <110°C	Approx 80 dia x 55	IP65
EJ-	Immersion >110°C	Approx 80 dia x 55	IP65
	EI-, EJ- ORDER POCKET SEPARATELY		
EK-	Fan Coil	1m Cable + Duct tube 80mm	IP65
EM-	Duct Averaging	Approx 80 dia x 55 4 sensors at 0.5m intervals along 2m cablex8 dia	IP65
ER-	Room	85H x 85W x 30D	IP30
EV-	Room + Adj knob	85H x 85W x 30D Pot 1-11kΩ	IP30
ES-	Strap-On	Approx 80 dia x 55 cable 2m includes strap for up to 6" pipe dia	IP65
EX-	Outside	Approx 80 dia x 55	IP65

Suffix	Compatibility	Check Temp/Resistance Chart
3K3A1	Alerton	Ibex
20K6A1	Honeywell	Excel
10K3A1	Honeywell	Aquatrol 2000
	Trend	York MR700,701,702,704,708,710
	Alerton	Backtalk
	Smart	
10K3A1/A	Satchwell	DRT,DDT,DWT,DOT,DST,DDU 1803,DC1400
10K4A1	Andover	
100K6A1	York	MR703,705,709
30K6A1	Drayton	DC1100 compensator
LST1	Landis & Staefa	T1
LS1000	Siemens, Landis	Ni 1000 QAA23, QAD21, QAE21
TAC1	TAC	
PT100	Serck etc	PT100
PT1000	Cylon etc	PT1000

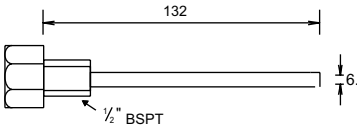
EGS-	Thimble sensor	Dome dia 15 x 16.5 L	Drill hole 12 dia.	200mm cable	IP30 -	Stainless Brushed Satin
EGB-	Thimble sensor	Dome dia 15 x 16.5 L	Drill hole 12 dia.	200mm cable	IP30 -	Brass Other colours on request
EGW-	Thimble sensor	Dome dia 15 x 16.5 L	Drill hole 12 dia.	200mm cable	IP30 -	White

TO ORDER - SELECT PREFIX + SUFFIX ie Room Sensor for Trend System = ER-10K3A1, Andover Duct sensor = ED-10K4A1

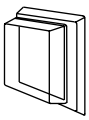
ACCESSORIES:

EE-STK	Stainless Steel Pocket ½" BSP 120mm x 6.2mm id for EI- & EJ
EE-ESS	Fixing strap for ESS Strap-On Thermostats & Sensors
EG-1000	Thermostat Guard Internal Dims 133H x 155W x 70D
EG-2000	Thermostat Guard Internal Dims 102H x 123W x 60D

EE-STK

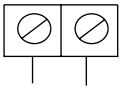


EG-1000 / EG-2000

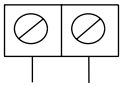


WIRING:

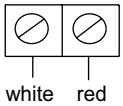
NTC Thermistor



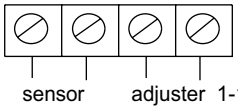
Ni 1000



PT100 / PT1000



EV..



INSTALLATION:

Terminals 0.5 -2.5mm²
Max length 100mm.

Sensor cable size 7/0.2mm
Screened cable is recommended.

Keep away from power cables/units which may cause interference.
The screen should be earthed at the controller end only.

BMS TEMPERATURE SENSORS

CUSTOM SWITCH PLATES

ESP-...

- A variety of special switch plates are available with different plate and sensor holder materials, with a choice of NTC sensor and with or without a potentiometer.

All plates fit a standard single gang BS box.
Plate size 86 x 86mm and approx 2mm thick

Most requirements can be specified using a unique part number. The complete part number can be constructed using the following step by step process:

STEP 1 Choose the plate material.

White plastic
ESP-W-

Stainless
ESP-S-

Brass
ESP-B

Other Finishes
See special items

STEP 2 Specify whether a potentiometer is required.

Stainless
ESP-S-P

Brass
ESP-B-P

STEP 3 Specify the NTC sensor required.
Any of the sensors on the Temperature Sensors for BMS page of this catalogue can be specified. For example 10K3A1, LS1000 etc.

STEP 4 Specify whether a button sensor holder is required

Thimble (standard)
ESP-S-10K3A1

Button
ESP-S-10K3A1/b

STEP 5 Specify any special items
Examples of this are:
Special engraving
Off switch on the potentiometer at the low value end
Special finishes-Note a sample must be provided for matching purposes.

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B.M.S TEMPERATURE RESISTANCE CHART

VALUES LISTED ARE FOR GUIDANCE PURPOSES ONLY - SEE MANUFACTURERS DATA FOR FURTHER INFORMATION IF REQUIRED.

	3K3A1	10K3A1	10K3A1/A	10K4A1	20K6A1	30K6A1	100K6A1	PT100	PT1000	TAC1	LST1	LS1000	SN1000
Temp ℃	Res Ω	Res Ω	Res Ω	Res Ω	Res Ω	Res Ω	Res Ω	Res Ω	Res Ω	Res Ω	Res Ω	Res Ω	Res Ω
-30	53005	176683	9465	135233	415479	622944	2077394	88.22	882	23800	1934	871.6	842
-20	29092	96974	9067	78930	221297	331876	1106485	92.16	922	13700	2030	913.5	893
-15	21868	72895	8796	61030	163875	245785	819378	94.12	941	10500	2078	934.7	919
-10	16589	55298	8472	47549	122473	183697	612366	96.09	961	8220	2127	956.2	946
-5	12694	42314	8093	37316	92336	138502	461683	98.04	980	6450	2176	977.9	973
0	9795	32650	7661	29490	70203	105305	351017	100	1000	5120	2226	1000.0	1000
1	9309	31030	7569	28157	66524	99787	332619	100.39	1004		2236	1004.4	1006
2	8850	29500	7475	26891	63058	94588	315258	100.78	1008		2246	1008.8	1011
3	8416	28054	7379	25689	59792	89689	298959	101.17	1012		2256	1013.3	1017
4	8006	26688	7281	24547	56713	85069	283558	101.56	1015		2266	1017.8	1022
5	7619	25396	7182	23462	53809	80713	269041	101.95	1019	4090	2276	1022.2	1028
6	7252	24173	7082	22430	51068	76604	255337	102.34	1024		2286	1026.7	1033
7	6905	23016	6980	21450	48483	72726	242414	102.73	1027		2296	1031.2	1039
8	6577	21921	6877	20517	46043	69064	230210	103.12	1031		2306	1035.7	1044
9	6266	20885	6772	19631	43739	65608	218688	103.51	1035		2316	1040.2	1050
10	5971	19904	6667	18787	41562	62347	207807	103.90	1039	3290	2326	1044.7	1056
11	5692	18974	6560	17983	39505	59257	197521	104.29	1043		2337	1049.3	1061
12	5428	18092	6453	17219	37561	56346	187803	104.68	1047		2347	1053.8	1067
13	5177	17257	6345	16490	35723	53585	178613	105.07	1051		2357	1058.4	1072
14	4940	16465	6236	15797	33985	50978	169924	105.46	1055		2367	1063.0	1078
15	4714	15714	6126	15136	32341	48511	161702	105.85	1058	2670	2377	1067.6	1084
16	4500	15001	6016	14507	30785	46178	153923	106.24	1062	2560	2388	1072.1	1090
17	4297	14325	5906	13906	29312	43969	146560	106.63	1066	2460	2398	1076.7	1095
18	4105	13623	5795	13334	27918	41877	139588	107.02	1070	2360	2408	1081.3	1101
19	3916	13053	5681	12788	26597	39895	132984	107.40	1074	2270	2418	1086.0	1107
20	3748	12494	5573	12268	25346	38019	126729	107.79	1078	2180	2429	1090.6	1112
21	3583	11943	5369	11771	24160	36240	120799	108.18	1082	2100	2439	1095.3	1118
22	3426	11420	5353	11297	23035	34554	115179	108.57	1086	2020	2449	1099.9	1124
23	3277	10923	5243	10845	21970	32955	109850	108.96	1090	1940	2460	1104.6	1130
24	3135	10450	5134	10413	20959	31438	104796	109.35	1094	1870	2470	1109.3	1136
25	3000	10000	5025	10000	20000	30000	100000	109.73	1098	1800	2480	1113.9	1141
26	2871	9572	4917	9606	19089	28635	95449	110.12	1101		2491	1119.6	1147
27	2749	9165	4809	9229	18225	27339	91128	110.51	1105		2501	1123.4	1153
28	2633	8777	4703	8869	17405	26108	87026	110.90	1110		2512	1128.1	1159
29	2522	8408	4597	8525	16625	24939	83129	111.28	1113		2522	1132.8	1165
30	2417	8056	4492	8197	15885	23828	79428	111.67	1117	1490	2532	1137.6	1171
35	1959	6530	3987	6754	12697	19046	63489	113.61	1136		2585	1161.5	1200
40	1598	5325	3518	5594	10211	15317	51058	115.54	1155	1040	2638	1185.7	1230
45	1310	4367	3089	4656	8259	12390	41301	117.47	1175		2692	1210.2	1260
50	1080	3601	2702	3893	6719	10079	33598	119.40	1194	740	2745	1234.9	1291
55	895.5	2985	2358	3271	5495	8243	27479	121.32	1213		2800	1260.0	1322
60	746.2	2487	2056	2760	4518	6777	22593	123.24	1232	540	2855	1285.4	1353
65	624.7	2082	1792	2339	3733	5600	18669	125.16	1251		2910	1311.1	1385
70	525.5	1751	1563	1990	3100	4650	15502	127.07	1271	400	2966	1337.1	1417
80	376.9	1256	1193	1458	2167	3251	10837	130.89	1309	300	3079	1390.1	1483
90	274.8	916.0	921	1084	1542	2313	7710	134.70	1347	230	3194	1444.4	1549
100	203.6	678.6	722	817.2	1115	1672	5574	138.50	1385	180	3311	1500.0	1618
110	153.0	510.1	575	624.1	818.9	1228	4092	142.29	1423		3430	1556.9	1688
120	116.6	388.6	466	482.5	609.9	914	3047	146.06	1461		3552	1615.3	1760
130	89.95	300.0	386	377.2	460.4	690	2299	149.82	1498		3675	1675.1	1833
140	70.23	234.1	324	298.1	351.8	527	1756	153.58	1536		3801	1736.4	1909
150	55.44	184.8	278	238.0	272.0	407	1357	157.31	1573		3929	1799.2	1987
160								161.04	1610				
170								164.76	1648				
180								168.46	1685				
190								172.16	1722				
200								175.84	1758				
250								194.07	1941				
300								212.02	2120				
350								229.67	2297				
400								247.04	2470				

BMS TEMPERATURE SENSORS

TEMPERATURE TRANSMITTERS 4-20MA / 0-10VDC

E..

A range of temperature transmitters fitted with PT100 sensing elements giving a 4-20mA or 0-10VDC output signal linear across the temperature range.

Consumption < 32mA & Load < 600Ω for 4-20mA devices

Consumption < 25mA & Load <10KΩ for 0-10VDC devices

Accuracy <1.5% of range

Ambient -20/+70 C

Temp Effect ± 2µA/ C

*CK1000 fitted with ÎKÌ type thermocouple

Enclosure Flammability:
ED, EF, EI, EM, ES, EX = UL94-V0
EH, ER = UL94-HB

Type 4-20mA	Type 0-10VDC	Description	Range ° C	Dimensions	Protection
ED-C040	**ED-V040**	Duct	-10 / +40	Approx 80 dia x 55 160mm probe	IP65
ED-C110	**ED-V110**	Duct	-10 / +110	Approx 80 dia x 55 160mm probe	IP65
EF-C400	**EF-V400**	Flue Gas	0 / 400	Probe length 230mm	IP65
EF-CK1000	**-**	Flue Gas	0 / 1000	Probe length 230mm *	IP65
EH-C040	**EH-V040**	Black Bulb	-10 / +40	85H x 85W x 30D + bulb 16mm	IP30
EI-C040	**EI-V040**	Immersion	-10 / +40	Approx 80 dia x 55	IP65
EI-C110	**EI-V110**	Immersion	-10 / +110	Approx 80 dia x 55	IP65
EJ-C160	**EJ-V160**	Immersion	-10 / +160	Approx 80 dia x 55	IP65
		EI- EJ- Order Pocket Separately			
EM-C040	**EM-V040**	Duct Averaging	-10 / +40	Approx 80 dia x 55 2m capillary	IP65
ER-C040	**ER-V040**	Room	-10 / +40	85H x 85W x 30D	IP30
ES-C040	**ES-V040**	Strap-On	-10 / +40	Approx 80 dia x 55 strap up to 6" pipe	IP65
ES-C110	**ES-V110**	Strap-On	-10 / +110	Approx 80 dia x 55 strap up to 6" pipe	IP65
EX-C040	**EX-V040**	Outside	-10 / +40	Approx 80 dia x 55	IP65

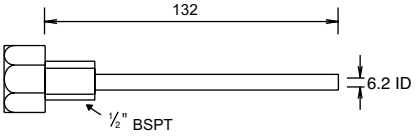
4-20mA devices Supply = 24VDC loop ± 25% 0-10vdc devices Supply = 24VAC/DC ± 15%

ACCESSORIES:

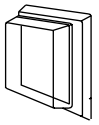
EE-2B Brass pocket for EI.. up to 110°C
EE-STK Stainless steel pocket for EI.. EJ..
EE-ESS Larger dia. fixing strap for strap-on stats / sensors. Per metre

EG-1000 Stat Guard Internal dims 133H X 155W X 70D
EG-2000 Stat Guard Internal dims 102H X 123W X 60D

EE-2B / EE-STK



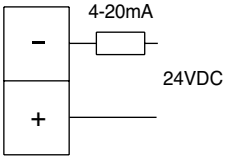
EG-1000 / EG-2000



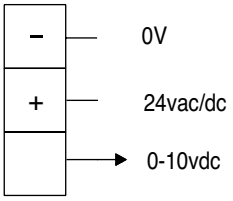
EE-ESS

WIRING:

4-20mA devices:



0-10VDC devices:



INSTALLATION: Terminals 0.5-2.5mm Max length 300m. Min sensor cable size 7/0.2mm Screened cable is recommended. Keep away from power cables/units which may cause interference. The screen should be earthed at the controller end only

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B.M.S INPUT - OUTPUT MODULES SINGLE AND ADJUSTABLE RELAY

ESRM..

DIN RAIL mounted relay modules compatible with building management systems, providing a switched output when an input signal is applied.
The 12VDC relay is suitable for use with TREND controllers ONLY which give a 0-10vdc output. For other 0-10vdc systems use model ESRM-10.


ESRM-12 / 24 / 230..


ESRM-10

Volt free contacts
Din rail mounting
Max Ambient -20 /+50 C
Auto eject relay clip
Flammability = UL94-V0

ESRM-10 only:

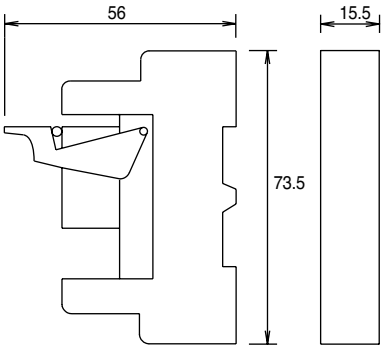
Off-On-Auto link to aid commissioning.
LED light on when relay energised.
Input current > 0.5mA

Type	Switch Point Input Approx.	Coil Voltage	Coil Resistance	Coil Current Approx mA	Switch Rating 230VAC SPDT	Compatibility	Enclosure
ESRM-12DC	8 VDC	12 VDC	576Ω	20	(3)A	TREND I-Q 0 10vdc ONLY	IP00
ESRM-24DC	17 VDC	24 VDC	1440Ω	18	12(3)A	24vdc B.M.S. controllers	IP00
ESRM-24AC	17 VAC	24 VAC	350Ω	32	12(3)A	TREND IQ	IP00
ESRM-230AC	172 VAC	230 VAC	32500Ω	3.3	12(3)A	Most B.M.S. controllers	IP00

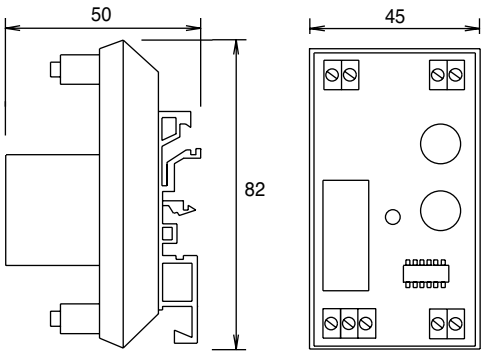
Type	Input	Supply ± 15%	Switch Rating 230VAC SPDT	Feedback Output	Consumption	Enclosure
ESRM-10	0-10VDC adj.	24VAC/DC	10(3)A	0-10VDC	51mA	IP00

DIMENSIONS

ESRM-12 / 24/ 230..

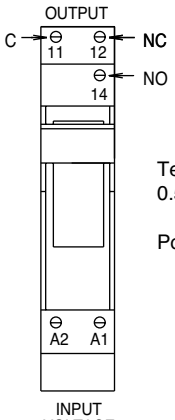


ESRM-10



WIRING:

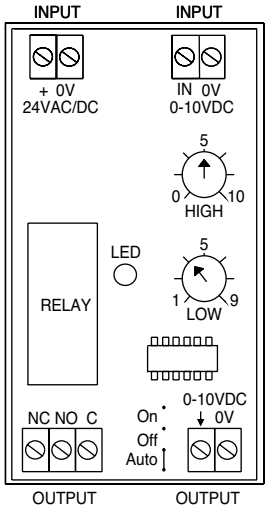
ESRM-12 / 24/ 230..



Terminal Size:
0.5 - 2.5mm rising clamps

Polarity is not important

ESRM-10



When the 0-10vdc input signal increases to the High setting contacts C-NO close.

When the 0-10vdc input signal decreases to the Low setting contacts C-NO open.

INSTALLATION: Terminals 0.5-2.5mm rising clamps. Min sensor / control signal cable size 7/0.2mm. Max length 100m.
Screened cable is recommended. The screen should be earthed at the controller end only.
Keep sensor/control signal wires away from power cables/units which may cause interference.

INPUT-OUTPUT MODULES

B.M.S RELAY OVERRIDE MODULE 1 - 4 X 0-10VDC INPUTS 4 RELAY OUTPUTS

EROV4

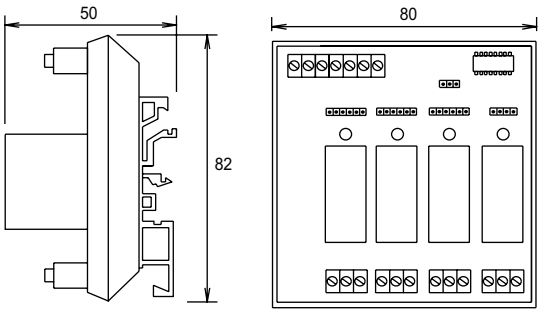
This unit provides up to 4 independent switched relay outputs from either 1,2,3 or 4 independent 0-10vdc inputs. Alternatively up to 4 outputs can be switched from just 1 x 0-10vdc input via link selection. All switch points are fixed at approx 5vdc on and 4vdc off. This product can also be used in place of 4 single relays.


EROV4

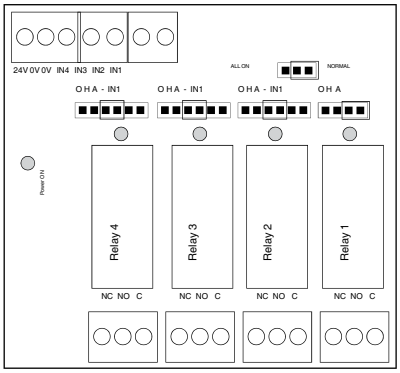
HAND-OFF-AUTO Manual Override links on each relay: -
HAND = Energised
OFF = De-energised
AUTO = Controller operated
Volt free contacts
LED indication
Din-Rail mounting
Input current > 1 mA
Max Ambient -10 /+50°C
Flammability = UL94-V0

Type	Supply +-15%	Input Signal	Switch Rating 230VAC SPDT	Relays On	Relays Off	Consumption	Mounting	Enclosure
EROV4	24VAC/DC	1-4 x 0-10VDC	4 x 10(3)A	> 5vdc	< 4vdc	60mA	Din Rail	IP00

DIMENSIONS:

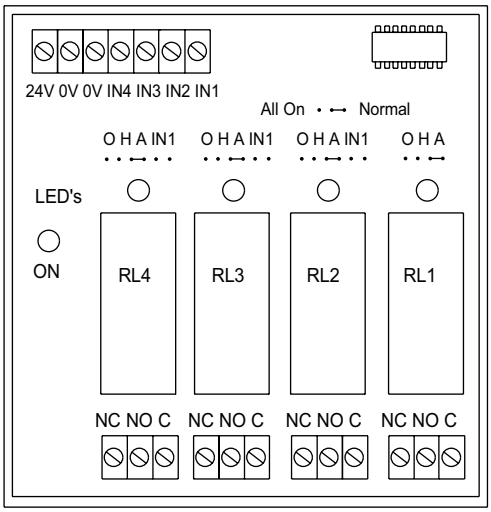


AX-ORM4C Connection



WIRING:

Up to 4 x 0-10vdc inputs



Each 0-10vdc input and relay output is independent. Outputs 1,2,3 or 4 can be linked to just one input IN1.
C-NO makes at approx >5vdc for each relay and C-NC makes at approx <4vdc for each relay. ie 0-4vdc OFF 5-10vdc ON.

O – Link to switch relay permanently off.
H – Link to switch relay permanently on.
A – Link to switch relay via the input signal.

ALL ON – Link to switch all output relays permanently on.
NORMAL – Link to switch the relays via 0-10vdc input.
IN1 – Outputs 1,2,3 or 4 can be linked to switch from 1 x 0-10v input.

Terminals 0.5-2.5mm² rising clamps
Screened cable is recommended
Keep sensor/control signal wires away from power cables/units which may cause interference.

Min sensor / control signal cable size 7/0.2mm
The screen should be earthed at controller end only

Max length 100m

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B.M.S INPUT OUTPUT MODULES 2 STAGE RELAY, RAISE - LOWER, HIGH LOW 0-10VDC

E2RM..

These products accept a 0-10vdc input and produce a 2 stage relay output which can be used for external plant switching. HIGH-LOW or RAISE-LOWER functions can be selected. For multi-stage heating & cooling, two of these units or other relay modules can be used with an ETC.. E13.. temperature controller or similar.

E2RM..

Select HIGH-LOW or RAISE-LOWER functions via link.

ON-OFF-AUTO link provided on each relay to aid commissioning.

LED's indicate relay status.

Volt free contacts

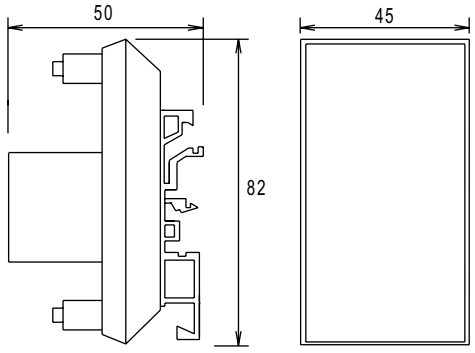
Din-Rail mounting

Input current > 0.5 mA

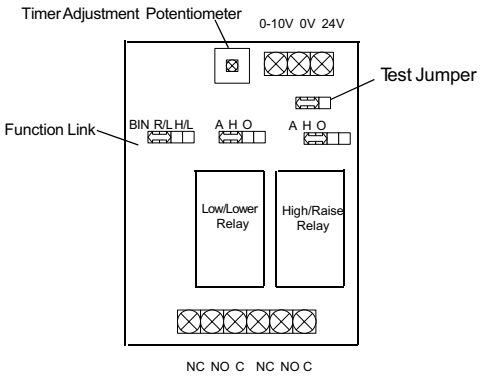
Flammability = UL94-V0
Max Ambient -10 /+50°C

Type	Supply +-15%	Input Signal	Power Consumption	Switch Rating 230VAC SPDT	Compatibility	Enclosure
E2RM	24VAC/DC	0-10vdc	40mA	2 x 10(3)A	Most B.M.S. Controllers	IP00

DIMENSIONS:



WIRING



INSTALLATION:

HIGH-LOW Mode - Relays switch in sequence.

High/Low	LOW	HIGH
0v	OFF	OFF
5v	ON	OFF
10v	ON	ON

RAISE-LOWER Mode - Relays switch as shown in the table below.

Raise/Lower	LOWER	RAISE
0v	OFF	OFF
5v	ON	OFF
7v	OFF	OFF
10v	OFF	ON

All values are maximum switching points. Exact switching points may be slightly lower than those stated

Terminals 0.5-2.5mm² rising clamps
Screened cable is recommended
Keep sensor/control signal wires away from power cables/units which may cause interference.

Min sensor / control signal cable size 7/0.2mm
The screen should be earthed at controller end only

Max length 100m

INPUT-OUTPUT MODULES

B.M.S INPUT - OUTPUT MODULES 3 STAGE RELAY, SEQUENCE, BINARY 0-10VDC

E3RMT..

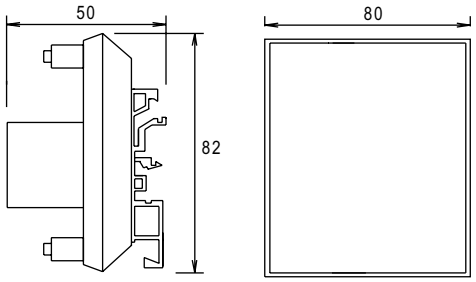
These products accept a 0-10vdc input and produce a 3 stage relay output which can be used for external plant switching.
4 modes of operation can be selected:
3 stage switching, Heat - Cool + Fan, Sequence or 2 Stage Binary.
For multi-stage heating & cooling, 2 of these units or other relay modules can be used with the E13.. temperature controllers or similar.

E3RMT

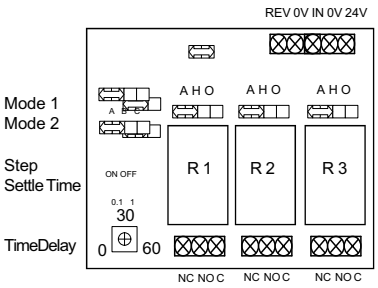
ON-OFF-AUTO Manual Override
links on each relay: -
ON = Energised
OFF = De-energised
AUTO = Controller operated
Volt free contacts LED's indicate relay status
Din-Rail mounting Consumption 80mA
Input current > 1 mA
Max Ambient -10 /+50°C
Flammability = UL94-V0

Type	Supply +-15%	Input Signal	Switch Rating 230VAC SPDT	Operation Selectable	Time Delay	Enclosure
E3RMT	24VAC/DC	0-10VDC	3 x 10(3)A	3 Stage relay or Fan + Cool/Heat Sequence or 2 Stage Binary	0-60s	IP00

DIMENSIONS:



WIRING:



Time Delay : Allows a time period before each stage switches on or off. Set to 0 if not required.

RS : Remove jumper before changing position of JP1 or JP2. Alternatively disconnect the power supply. Replace jumper RS after changing JP1 or JP2

AHO : A = Auto H = Relay On O = Relay Off

JP1/ JP2 : Mode settings

MODE	MODE 1	MODE 2
3 stage	C	C
Fan + heat/cool	B	A
Sequence	C	B
2 stage Binary	B	B

INSTALLATION:

3 STAGE RELAY MODE

1-3 switch on as input increases

	LOW	MID	HIGH
0v	OFF	OFF	OFF
4v	ON	OFF	OFF
7v	ON	ON	OFF
10v	ON	ON	ON

FAN - HEAT - COOL MODE

	FAN	COOL	HEAT
0v	OFF	OFF	OFF
4v	ON	ON	OFF
7v	0N	OFF	OFF
10v	ON	OFF	ON

SEQUENCE MODE

Only 1 stage on at any time

	RL1	RL1	RL2
0v	OFF	OFF	OFF
4v	ON	OFF	OFF
7v	OFF	ON	OFF
10v	OFF	OFF	ON

BINARY MODE

	OUT 1	OUT 2
0v	OFF	OFF
4v	ON	OFF
7v	OFF	ON
10v	ON	ON

All values are maximum switching points. Exact switching points may be slightly lower than those stated

Terminals 0.5-2.5mm² rising clamps
Min sensor / control signal cable size 7/0.2mm
Max length 100m
Screened cable is recommended
The screen should be earthed at controller end only
Keep sensor/control signal wires away from power cables/units which may cause interference.

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B.M.S INPUT - OUPUT MODULES 4 STAGE RELAY, SEQUENCE, BINARY 0-10VDC

E4RM

These products accept a 0-10vdc input and produce a 4 stage relay output which can be used for external plant switching.
Suitable for staging (**which can be reversed**) or sequencing operation.
For multi-stage heating & cooling, two of these units or other relay modules can be used with the E13.. temperature controllers or similar.

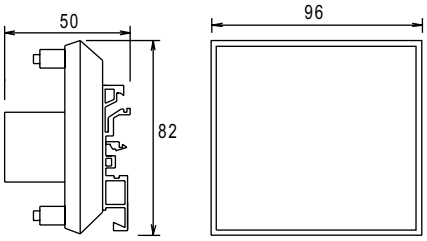
E4RM

ON-OFF-AUTO Manual Override links on each relay: -
ON = Energised
OFF = De-energised
AUTO = Controller operated
LED's indicate relay status
Volt free contacts Input current > 1mA
Din-Rail mounting Consumption 100mA
Max Ambient -10 /+50°C
Flammability = UL94-V0

Type	Supply	Input Signal	Switch Rating +-15%	Time Delay	Compatibility 230VAC SPDT	Enclosure
E4RM	24VAC/DC	0-10VDC	4 x 10(3)A	0-200s	Most BMS Controllers	IP00

UP TO 10 STAGED SWITCHING ACROSS 0-10VDC CAN BE ACHIEVED WHEN THIS PRODUCT IS USED WITH THE E6RM

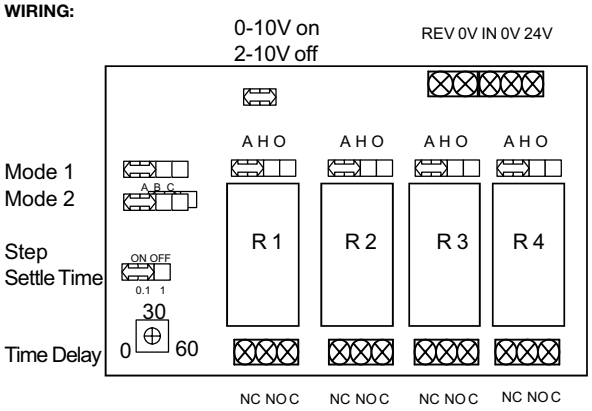
DIMENSIONS:



MODE RESET LINK : Remove link before changing modes and re-fit the link to reset the operation.

TIME DELAY : Allows a time period between each stage switching on or off.

WIRING:



INSTALLATION:

STAGED MODE mode1 = C mode2 = C
Relays 1-4 switch on as the input signal increases

INPUT	RLY 1	RLY 2	RLY 3	RLY 4
0v	OFF	OFF	OFF	OFF
2.4V	ON	OFF	OFF	OFF
4.8V	ON	ON	ON	OFF
7.2V	ON	ON	ON	OFF
9.6V	ON	ON	ON	ON

STAGED MODE mode1 = A mode 2 = B
Relays 4-1 switch on as the input signal increases when terminals R-R are closed via a volt free contact.

INPUT	RLY 1	RLY 2	RLY 3	RLY 4
0v	OFF	OFF	OFF	OFF
2.4V	OFF	OFF	OFF	ON
4.8V	OFF	OFF	ON	ON
7.2V	OFF	ON	ON	ON
9.6V	ON	ON	ON	ON

SEQUENCED MODE mode1 = C mode2 = C
Only one relay is on at any time

INPUT	RLY 1	RLY 2	RLY 3	RLY 4
0v	OFF	OFF	OFF	OFF
2.4V	ON	OFF	OFF	OFF
4.8V	OFF	ON	OFF	OFF
7.2V	OFF	OFF	ON	OFF
9.6V	OFF	OFF	OFF	ON

STAGED MODE + E6RM = 10 STG. JP1 = B JP2 = A
Connect 0-10VDC to both E6RM and E4RM.
No time delay or reverse action.

INPUT	RLY 1	RLY 2	RLY 3	RLY 4
6V	OFF	OFF	OFF	OFF
7V	ON	OFF	OFF	OFF
8V	ON	ON	OFF	OFF
9V	ON	ON	ON	OFF
10V	ON	ON	ON	ON

BINARY MODE JP1 = B JP2 = B

INPUT	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.4	9.6
RLY 1	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON
RLY 2	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON
RLY 3	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON
RLY 4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON	ON

All values are maximum switching points. Exact switching points may be slightly lower than those stated
Terminals 0.5-2.5mm² rising clamps Min sensor / control signal cable size 7/0.2mm Max length 100m
Screened cable is recommended The screen should be earthed at controller end only
Keep sensor/control signal wires away from power cables/units which may cause interference.

INPUT-OUTPUT MODULES

B.M.S INPUT - OUTPUT MODULES 6 (10) STAGE RELAY, SEQUENCE 0-10VDC

E6RM

These products accept a 0-10vdc input and produce a 6 stage relay output which can be used for external plant switching. Suitable for staging (which can be reversed) or sequencing operation.
For multi-stage heating & cooling, two of these units or other relay modules can be used with the E13.. temperature controllers or similar.

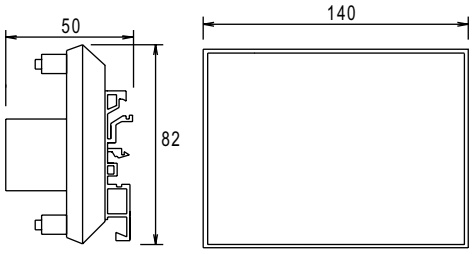
E6RM

ON-OFF-AUTO Manual Override
links on each relay: -
ON = Energised
OFF = De-energised
AUTO = Controller operated
Volt free contacts LED's indicate relay status
Din-Rail mounting Consumption 166mA
Input current > 1mA
Max Ambient -10 /+50°C
Flammability = UL94-V0

Type	Supply +-15%	Input Signal	Switch Rating 230VAC SPDT	Time Delay	Compatibility	Enclosure
E6RM	24VAC/DC	0-10VDC	6 x 10(3)A	0-200s	Most BMS Controllers	IP00

UP TO 10 STAGED SWITCHING ACROSS 0-10VDC CAN BE ACHIEVED WHEN THIS PRODUCT IS USED WITH THE E4RM

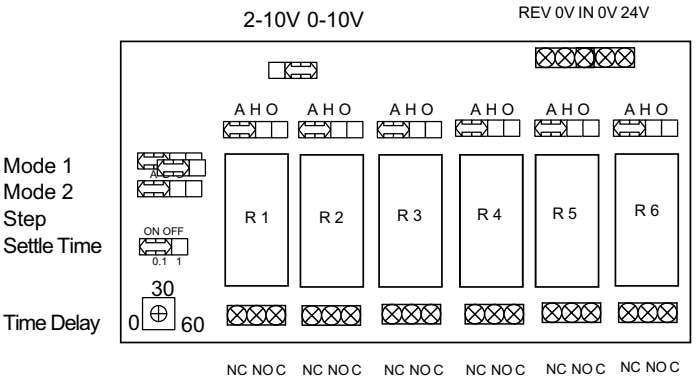
DIMENSIONS:



MODE RESET LINK : Remove link before changing modes and re-fit the link to reset the operation.

TIME DELAY : Allows a time period between each stage switching on or off.

WIRING:



INSTALLATION:

STAGED MODE mode1 = C mode2 = C
Relays 1-6 switch on as the input signal increases.

INPUT	RLY 1	RLY 2	RLY 3	RLY 4	RLY 5	RLY 6
0v	OFF	OFF	OFF	OFF	OFF	OFF
2v	ON	OFF	OFF	OFF	OFF	OFF
3v	ON	ON	OFF	OFF	OFF	OFF
4.5v	ON	ON	ON	OFF	OFF	OFF
6v	ON	ON	ON	ON	OFF	OFF
7.8v	ON	ON	ON	ON	ON	OFF
10v	ON	ON	ON	ON	ON	ON

STAGED MODE - REVERSE D mode1 = A mode2 = B
Relays 6-1 switch on as the input signal increases when terminals R-R are closed via a volt free contact.

INPUT	RLY 1	RLY 2	RLY 3	RLY 4	RLY 5	RLY 6
0v	OFF	OFF	OFF	OFF	OFF	OFF
2v	OFF	OFF	OFF	OFF	OFF	ON
3v	OFF	OFF	OFF	OFF	ON	ON
4.5v	OFF	OFF	OFF	ON	ON	ON
6v	OFF	OFF	ON	ON	ON	ON
7.8v	OFF	ON	ON	ON	ON	ON
10v	ON	ON	ON	ON	ON	ON

SEQUENCED MODE mode1 = C mode2 = B
Only one relay is on at any time.

INPUT	RLY 1	RLY 2	RLY 3	RLY 4	RLY 5	RLY 6
0v	OFF	OFF	OFF	OFF	OFF	OFF
2v	ON	OFF	OFF	OFF	OFF	OFF
3v	OFF	ON	OFF	OFF	OFF	OFF
4.5v	OFF	OFF	ON	OFF	OFF	OFF
6v	OFF	OFF	OFF	ON	OFF	OFF
7.8v	OFF	OFF	OFF	OFF	ON	OFF
10v	OFF	OFF	OFF	OFF	OFF	ON

STAGED MODE + E4RM = 10 STAGES JP1=B JP2=A
Connect 0-10VDC to both E6RM and E4RM. No time delay or reverse action.

INPUT	RLY 1	RLY 2	RLY 3	RLY 4	RLY 5	RLY 6
0v	OFF	OFF	OFF	OFF	OFF	OFF
1v	ON	OFF	OFF	OFF	OFF	OFF
2v	ON	ON	OFF	OFF	OFF	OFF
3v	ON	ON	ON	OFF	OFF	OFF
4v	ON	ON	ON	ON	OFF	OFF
5v	ON	ON	ON	ON	ON	OFF
10v	ON	ON	ON	ON	ON	ON

All values are maximum switching points. Exact switching points may be slightly lower than those stated
Terminals 0.5-2.5mm² rising clamps
Min sensor / control signal cable size 7/0.2mm
Max length 100m
Screened cable is recommended
The screen should be earthed at controller end only
Keep sensor/control signal wires away from power cables/units which may cause interference.

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B.M.S INPUT - OUTPUT MODULES 0-10VDC TO 0-20V PHASE CUT

E..PCM

These units convert one or two 0-10vdc inputs to one or two 0-20V phase-cut outputs to control Staefa 2 wire valves and Belimo actuators.

Input current < 1mA

Use the correct size transformer for the VA rating of the actuator / valve.

The output signal varies at teh same rate as the input signal.

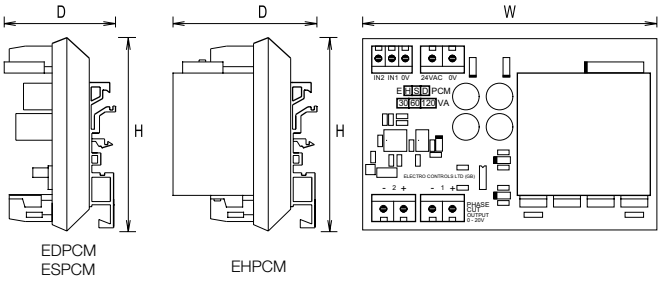
Humidity 0-90%HR non condensing

Ambient -10/+50°C

Consumption 51mA Flammability = UL94-V0

Type	Power Supply ±15%	Input Signal	Output Signal	MaxActuator Rating	Mounting	Enclosure
EDPCM	24VAC	2 x 0-10VDC	2 x 20V	**30VA/channel**	Din Rail	IP00
ESPCM	24VAC	1 x 0-10VDC	1 x 20V	**60VA**	Din Rail	IP00
EHPCM	24VAC	1 x 0-10VDC	1 x 20V	**120VA**	Din Rail	IP00

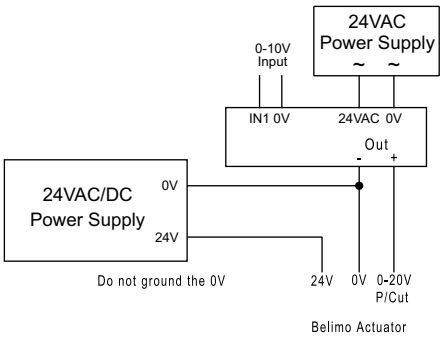
DIMENSIONS



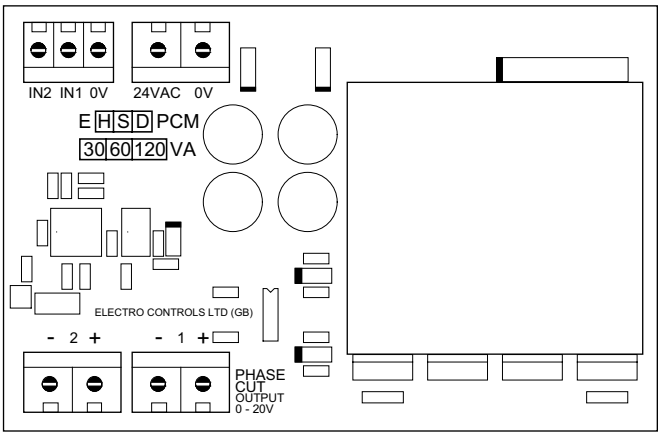
	H	W	D
EDPCM	77	114	48
ESPCM	77	114	48
EHPCM	77	114	62

WIRING:

Example for wiring to Belimo Actuator



EDPCM
ESPCM
EHPCM



For the 24VAC POWER SUPPLY select transformer VA rating according to actuator rating.

NOTE: The ESPCM & EHPCM can only be used for 1 x 0-10VDC input & 1 x 0-20V phase cut output using channel 1.
The EDPCM can be used for 2 x 0-10VDC input & 2 x 0-20V phase cut output using channels 1&2.

If the 0-10VDC input signal is removed, that channel will be cut off.
THE OUTPUTS MUST NOT BE CONNECTED OR DISCONNECTED WHEN THE UNIT IS POWERED AS THIS WILL DAMAGE THE UNIT.

INSTALLATION: Terminals 0.5-2.5mm rising clamps Min sensor / control signal cable size 7/0.2mm Max length 100m.
Screened cable is recommended The screen should be earthed at the controller end only
Keep sensor/control signal wires away from power cables/units which may cause interference.

INPUT-OUTPUT MODULES

B.M.S INPUT - OUTPUT MODULES 4 & 6 DIGITAL INPUT MULTIPLEXER

E4DIM, E6DIM

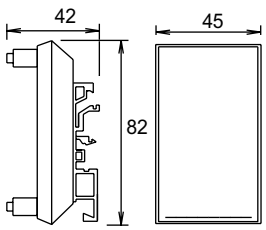
These units allow up to 4 or 6 volt free inputs to be converted into a single 0-10vdc analogue output channel which can in turn be decoded by a B.M.S controller into digital status bits.

LED status indication
Input signal test links
Load > 4.7kΩ
Din-Rail mounting
Compatible with TREND A to D Function module in the IQ controller.
Max Ambient -10 /+50°C
Flammability = UL94-V0

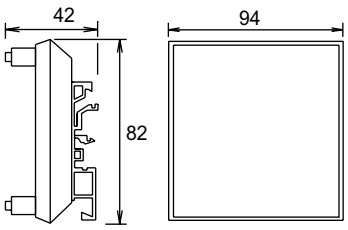
Type	Power Supply ±15%	Consumption Max.	Inputs 24VAC/DC 230VAC	Output Selectable	Mounting	Enclosure
E4DIM	24VAC/DC	50mA	4 x Volt Free Contacts	0-9vdc or 0.4-9.4vdc	Din Rail	IP00
E6DIM	24VAC/DC	60mA	6 x Volt Free Contacts	0-10vdc	Din Rail	IP00

DIMENSIONS

E4DIM



E6DIM



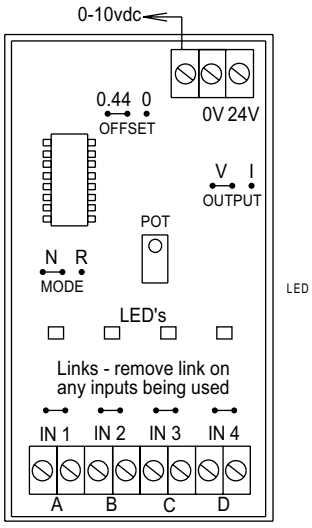
WIRING:

OUTPUT LINK:
Select V for vdc output

OFFSET LINK:
Select 0-9vdc
or 0.4-9.4vdc output
adjustable via pot.

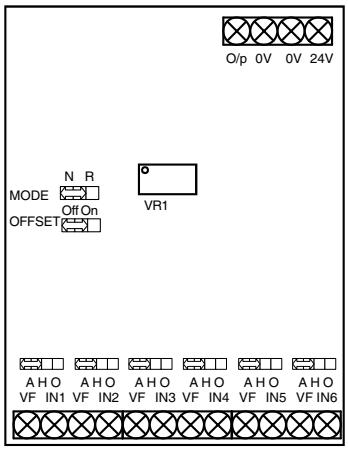
MODE LINK:
Select N for normal output

E4DIM



VOLT FREE INPUTS

E6DIM



Jumpers

Mode: Normal or Reverse Action :
N = Normal
R = Reverse

Offset: Voltage versions
Off = 0-10V
On = 2-10V
Current versions
Off = 0-20mA
On = 4-20mA

All inputs must be volt free. Screened cable is recommended to eliminate electrical interference.

INSTALLATION: The unit is pre-calibrated, therefore the potentiometer should not require field adjustment of the 0-10vdc signal.

Total output voltage is equal to the sum of the inputs that are switched ON :-

E4DIM 0-9vdc Output:
Input A = 4.8V B = 2.4V C = 1.2V D = 0.6V If A + C are ON then output = 6V if B + C are ON then output = 3.6V

E4DIM 0.4-9.4vdc Output:
Input A = 5.2V B = 2.8V C = 1.6V D = 1.0V If A + C are ON then output = 6.8V if B + C are ON then output = 4.4V

E6DIM: Input IN1 = 0.156V IN2 = 0.313V IN3 = 0.625V IN4 = 1.25V IN5 = 2.5V IN6 = 5V

Terminals 0.5-2.5mm² rising clamps Min sensor / control signal cable size 7/0.2mm Max length 100m
Screened cable is recommended The screen should be earthed at controller end only
Keep sensor/control signal wires away from power cables/units which may cause interference.

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B.M.S INPUT-OUTPUT MODULES 0-10VDC IN 0-135Ω / 0-1000Ω OUT

DRN3.1..

- These products accept a 0-10VDC input and convert it into a proportional 0-135Ω or 0-1000Ω resistance output.

  For use in electrical actuator control, electronic potentiometer, resistive sensor simulation.

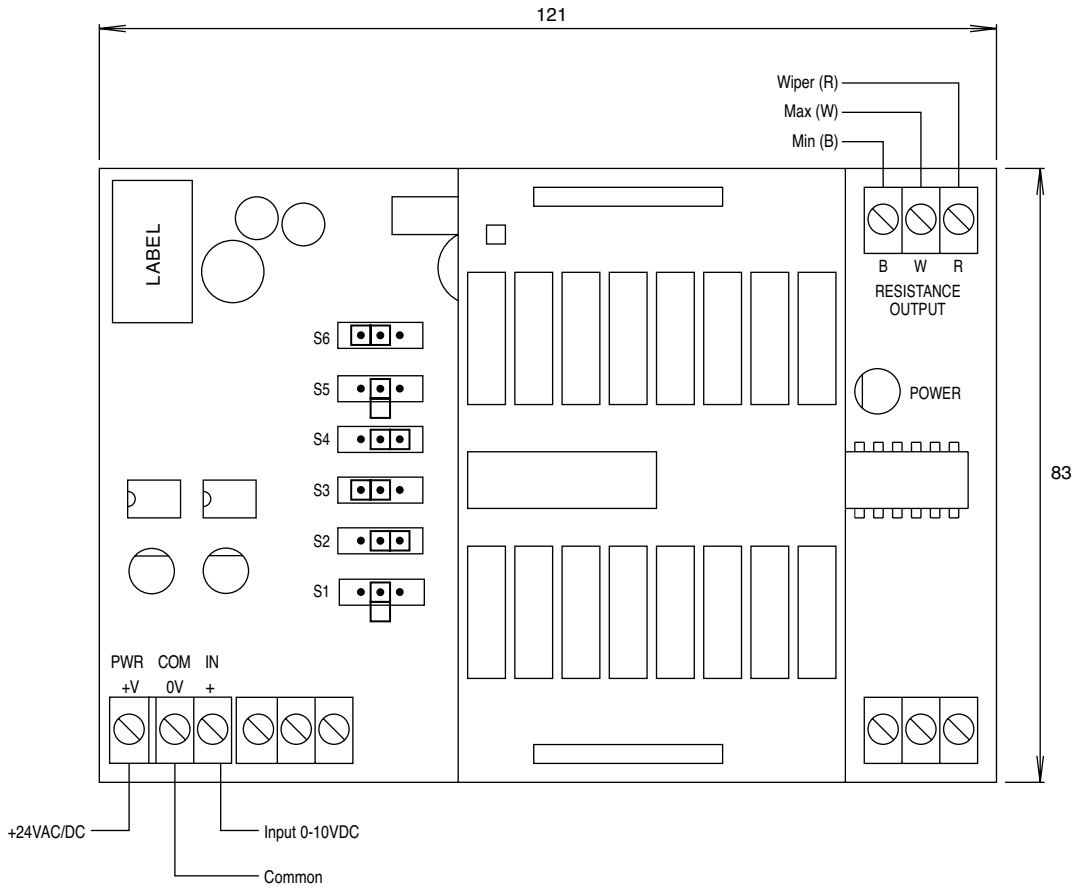
DRN3.1..

Electrically Isolated Resistive Output
Power and signal Status Indicator
Input Impedance: 0-10VDC 10KΩ
4-20mA 250Ω

Type	Supply ±10%	Input	Output	Output Resolution	Consumption	Protection
DRN3.1.1	24VAC/DC	2 x 0-10VDC	0-135Ω	256 steps	250mA	IP00
DRN3.1.2	24VAC/DC	0-10VDC	0-1000Ω	256 steps	250mA	IP00

WIRING:

DRN3.1..



The jumper settings for S1- S6 are as shown above.

The resistance between terminals B and R will increase as the input signal increases and the resistance between W and R will decrease.

INSTALLATION: Terminals 0.5 - 2.5mm² Max length 100m. Sensor cable size 7/0.2mm Screened cable is recommended. Keep away from power cables/units which may cause interference. The screen should be earthed at the controller 0V terminal only.

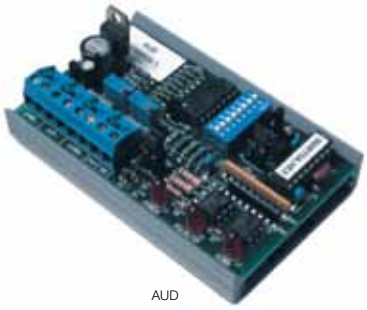
INPUT-OUTPUT MODULES

B.M.S INPUT-OUTPUT MODULE RAISE / LOWER IN 0-10VDC OUT

AUD

This product converts a Floating Point Input to a 0-10VDC Output.

There are two inputs on the AUD, one to increase the output and one to decrease the output. The output is stable when both inputs are off.



AUD

255 Step Resolution

Pulsed relay contact input

Accuracy +/-3%

LED Status Indicators

Field selectable rate of change

Field Adjustable Output with manual Override Potentiometer

Type	Supply ±10%	Output	Rate of Change*	Signal Trigger Level	Consumption	Protection
AUD	24VAC/DC	0-10VDC	45sec - 240sec	24 to 26.4VAC	50mA	IP00

*The time it takes for the output to go from 0-10VDC

WIRING:

INSTALLATION:

Terminals 0.5 - 2.5mm

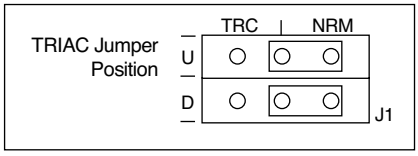
Sensor cable size 7/0.2mm

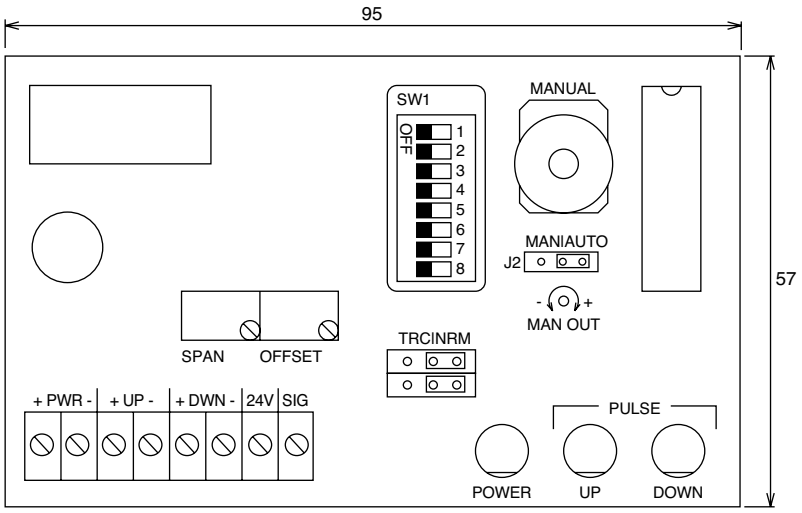
Keep away from power cables/units which may cause interference.

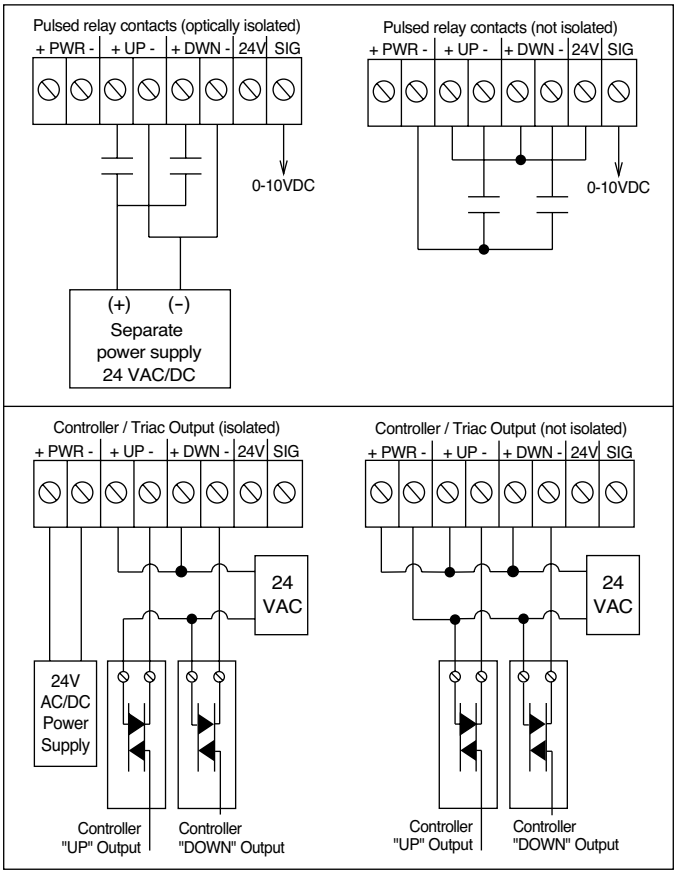
Max length 100m.

Screened cable is recommended.

The screen should be earthed at the controller 0V terminal only.







Set DIP Switch for Output

1 2 3 4 5 6 7 8 OFF — Voltage Output

Set DIP Switch for Offset of Output

1 2 3 4 5 6 7 8 OFF — Offset of 1volt

1 2 3 4 5 6 7 8 OFF — Adjustable Offset of 0 - 5V

Set DIP Switch for Full Scale Output Ramping Time

1 2 3 4 5 6 7 8 OFF — 45 seconds

1 2 3 4 5 6 7 8 OFF — 60 seconds

1 2 3 4 5 6 7 8 OFF — 120 seconds

1 2 3 4 5 6 7 8 OFF — 240 seconds

Set DIP Switch for Maximum Signal Span Output

1 2 3 4 5 6 7 8 OFF — 1 volt

1 2 3 4 5 6 7 8 OFF — 10 volt

1 2 3 4 5 6 7 8 OFF — 4 volt

1 2 3 4 5 6 7 8 OFF — 13 volt

1 2 3 4 5 6 7 8 OFF — adjustable 1 - 11 volt

1 2 3 4 5 6 7 8 OFF — adjustable 10 - 20 volt

1 2 3 4 5 6 7 8 OFF — adjustable 4 - 14 volt

Black Area Indicates Switch Direction

OFF

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B.M.S RESISTANCE INPUT MODULE 135/1000Ω IN 0-10VDC OUT

ERIM

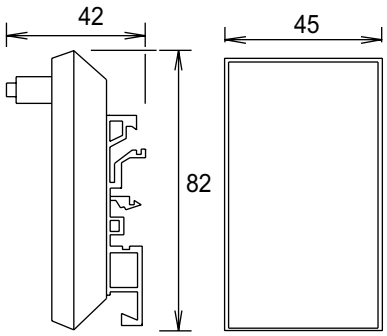
These units convert 0-135 ohm or
0-1000 ohm input to a 0-10vdc output.

Multi-turn pot to adjust output.
LED indication
Max ambient -10 /+50°C
Din-Rail mounting
Flammability = UL94-V0

Type	Supply ±10%	Input Adjustable	Output	Consumption	Mounting	Protection
ERIM 135R	24VAC/DC	0-135Ω	0-10VDC	20mA	Din Rail	IP00
ERIM 1K	24VAC/DC	0-1000Ω	0-10VDC	20mA	Din Rail	IP00

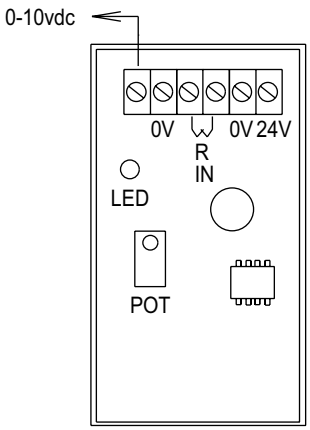
DIMENSIONS

ERIM 135R/1K



WIRING:

ERIM 135R/1K



INSTALLATION: Terminals 0.5-2.5mm rising clamps
Min sensor / control signal cable size 7/0.2mm
Screened cable is recommended
The screen should be earthed at the controller end only
Keep sensor/control signal wires away from power cables/units which may cause interference.

INPUT-OUTPUT MODULES

TRANSMITTER SETPOINT CONTROLLER 0-10VDC / 4-20MA IN 0-10VDC OUT

E10-10

This product can be used with pressure, temperature, humidity, flow or level transmitters. By connecting the transmitter output into this controller a setpoint can be adjusted and a 0-10VDC output will be produced over the desired proportional band.

Input current > 0.5mA

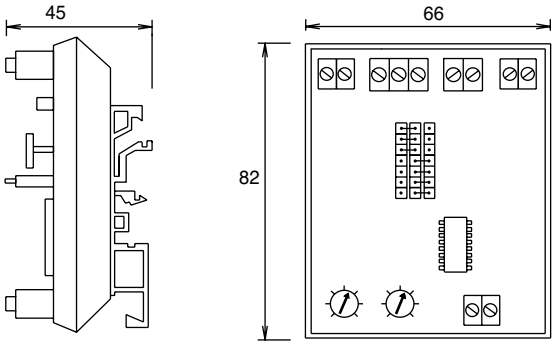
Max Ambient -10/+50°C

Flammability = UL94-V0

Type	Setpoint Range	Proportional Band	Input	Output	Supply ±15%	Consumption	Mounting	Enclosure
E10-10	0-100%	0-50%	0-10VDC or 4-20mA	0-10VDC	24VAC/DC	32mA	Din Rail	IP00

DIMENSIONS

E10-10



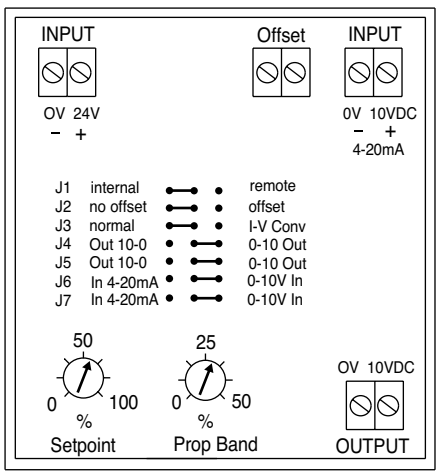
EXAMPLES:

E10-10 used with a pressure transmitter ie range 0-16 bar & 0-10vdc output.
A setpoint of 50% represents 8 bar. A prop band of 10% represents 1.6 bar (10% of the range) J4 & J5 link on 0-10.
Therefore the output will be 0-10vdc linear over the range from 8 bar 0vdc to 9.6 bar 10vdc.
If J4 & J5 link is on 10-0 then the output will be 0-10vdc linear over the range from 8 bar 0vdc to 6.4 bar 10vdc.

E10-10 used with a humidity transmitter ie range 0-100% RH & 0-10vdc output.
A setpoint of 40% represents 40% RH. A prop band of 20% represents 20% RH (20% of the range) J4 & J5 link on 0-10.
Therefore the output will be 0-10vdc linear over the range from 40% RH 0vdc to 60% RH 10vdc.
If J4 & J5 link is on 10-0 then the output will be 0-10vdc linear over the range from 40% RH 0vdc to 20% RH 10vdc.

WIRING:

E10-10



J1	Fit link to internal
J2	To select remote setpoint offset ±5% or no offset
J3	Select I-V Conv to convert a 4-20mA input signal directly to 0-10VDC Output. The setpoint adj has no effect in this mode.
J4 & J5	Set both to 0-10 with rising input above the setpoint, the output also rises. Set both to 10-0 with falling input below the setpoint, the output rises.
J6 & J7	Set both to 4-20mA or 0-10V to select the input signal

INSTALLATION:

Terminals 0.5-2.5mm² rising clamps — Min sensor / control signal cable size 7/0.2mm
Screened cable is recommended — The screen should be earthed at the controller end only
Keep sensor/control signal wires away from power cables/units which may cause interference.

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B.M.S INPUT - OUTPUT MODULES ANALOGUE RESCALING VDC / MA

ARM

This unit can be used to convert / rescale current or voltage signals:

VDC input converted to mA output.
mA input converted to VDC output.
mA or VDC input to mA or VDC reversed output.
Enlarging or reducing signals.

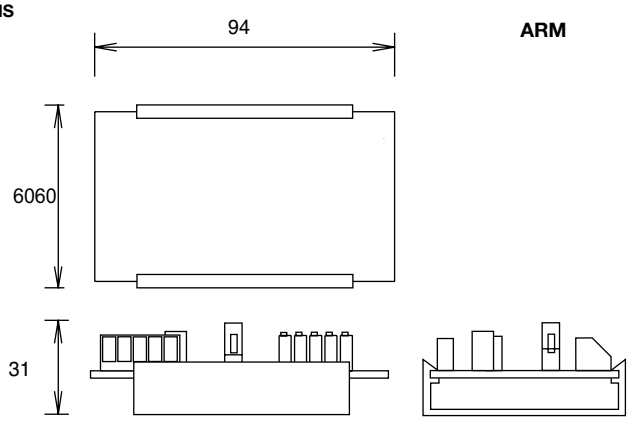
Adjustments are made using the potentiometers.

ARM

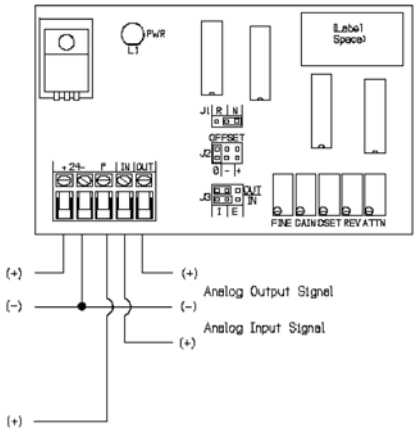
Input Impedence:
1MΩ Voltage 250Ω Current
Consumption: 200mA maximum
Output current: 44mA maximum
LED Power Indicator
Common Applications :
4-20mA in to 0-10vdc out
0-10vdc in to 4-20mA out
Reversed Output
Signal / Sensor Range adjustment

Type	Supply ± 10%	Input Adjustable	Output Adjustable	Ambient Humidity	Ambient Temp °C	Mounting	Protection
ARM	24VAC/DC	0 - 44 mA 0 -35 vdc	1 - 44 mA 0.25 - 20 vdc	10 to 95% non-condensing	0-50	Panel	IP00

DIMENSIONS



ARM



SETUP :

Factory Calibration -

No Attenuation of the Input Signal
Voltage Input
Voltage Output
Normal Acting Output Signal
No Offset to the Output Signal
Gain of 1 to the Output Signal (1:1)

Trim Pots Fully Clockwise
FINE
GAIN = gain of 1
REV = 0 volts reverse
OFFSET = 0 volts offset

Trim Pots Fully Counter-clockwise
ATTN = no input signal attenuation

The input signal is NOT isolated from the output.
When using a 24VAC supply, all devices connected to the ARM must use the same ground.
Terminals 0.5-2.5mm .
Min cable size 7/0.2mm. Max length 100m
Keep sensor/control signal wires away from power cables/units which may cause interference.
Screened cable is recommended

0-10vdc to 5-10VDC
J1 to normal position.
J2 to positive position.
J3 to voltage input, voltage output.
Apply 0vdc to the input.
Adjust OFFSET for a 5vdc output.
Apply 10vdc to the input.
Adjust ATTN for a 10vdc output.

0-10VDC to 4-20mA
J1 to normal position.
J2 to positive position.
J3 to voltage input, current output.
Apply 0vdc to the input.
Adjust OFFSET for a 4mA output.
Apply 10vdc to the input.
Adjust ATTN for a 20mA output.

4-20mA to 0-10VDC
J1 to normal position.
J2 to negative position.
J3 to current input, voltage output.
Apply 4mA to the input.
Adjust OFFSET for a 0vdc output.
Apply 20mA to the input.
Adjust GAIN for a 10vdc output.

0-10VDC to 8-2VDC
J1 to reverse position.
J2 to no offset position.
J3 to voltage input, voltage output.
Apply 0vdc to the input.
Adjust REV for an 8vdc output .
Apply 10vdc to the input.
Adjust ATTN for a 2vdc output.

0-10VDC to 0-5VDC
J1 to normal position.
J2 to no offset position.
J3 to voltage input, voltage output.
Apply 0vdc to the input.
Check output is 0vdc.
Apply 10vdc to the input.
Adjust ATTN for a 5vdc output.

Jumper Settings -

J1 - Output Direction
Reverse
Normal

J2 - Offset Setting
No Offset
Negative
Positive

J3 - Input / Output Setting
Current Output
Current Input
Voltage Output
Current Input
Current Output
Voltage Input
Voltage Output
Voltage Input

NOTE : Equivalent Calibration voltage = Required Input Signal Amps x 250 (ie. 4mA is 0.004 x 250 =1vdc and 20mA is 0.020 x 250 =5vdc)
Set up the unit with a voltage input and / or output (changing J3) using the formula. If required change J3 back to the correct setting.

INPUT-OUTPUT MODULES

B.M.S INPUT - OUTPUT MODULES ANALOGUE BUFFER MODULE 0-10VDC

ABM4

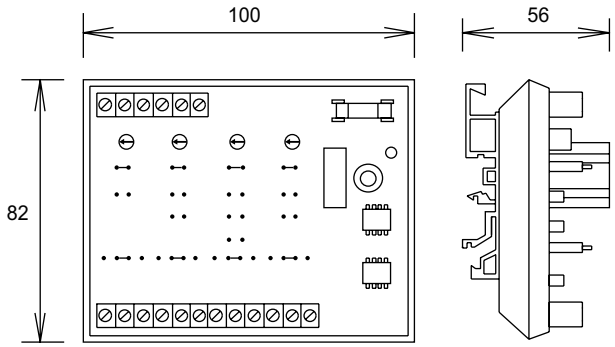
This unit can be used to generate / reroute up to four 0-10vdc signals:

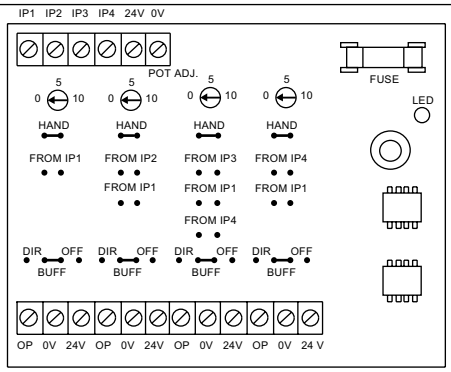
Applications include - Manual adjustment of the 0-10vdc signal potentiometer can be used to position actuators etc, providing commissioning test signals, buffering one signal to drive several actuators or buffering four signals to drive four actuators - each of which draws a high input signal current.

- Direct / Buffer / Off Link Selectable
- Hand / Auto Link Selectable
- LED Power Indicator
- Output Signal Current: 20mA per channel
- Output Power Current: 6A
- Operating Current: 260mA AC 115mA DC
- Input Time Constant: 1ms
- Manual Output Adjustment
- Output Voltage Test Points
- Terminals: Rising Clamps 0.5-2.5mm²

Type	Supply ± 10%	Input	Output Direct or Buffered	Ambient Humidity	Ambient Temp °C	Mounting	Protection
ABM4	24VAC/DC	0 - 10 vdc	0 - 10 vdc	0 to 90% non-condensing	0-50	Din Rail	IP00

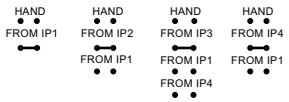
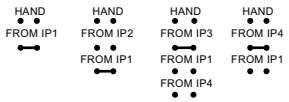
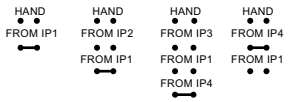
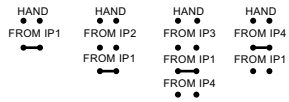
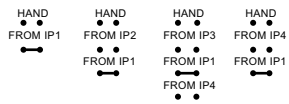
DIMENSIONS





INSTALLATION:

Selecting Inputs -

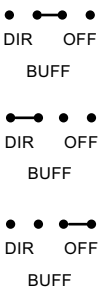
Each output separate	Output 1 linked to input 1 Output 2 linked to input 2 Output 3 linked to input 3 Output 4 linked to input 4	
Two linked, two separate	Output 1 linked to input 1 Output 2 linked to input 1 Output 3 linked to input 3 Output 4 linked to input 4	
Two sets of two linked	Output 1 linked to input 1 Output 2 linked to input 1 Output 3 linked to input 4 Output 4 linked to input 4	
Three linked, one separate	Output 1 linked to input 1 Output 2 linked to input 1 Output 3 linked to input 1 Output 4 linked to input 4	
All linked	Output 1 linked to input 1 Output 2 linked to input 1 Output 3 linked to input 1 Output 4 linked to input 1	

Buffering Outputs -

When an output is set to BUFFER the signal is buffered to 20mA in both HAND and AUTO modes.

When an output is set to DIRECT, the signal is only powered from the pot in HAND mode or the input in AUTO mode.

When the output is set to OFF, the output signal is open circuit.



Hand Mode -

When an input link is set to HAND, the output signal can be set by adjusting the associated pot.

NOTE -

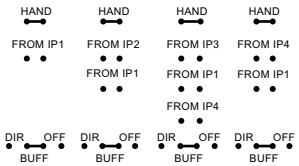
All the 0v terminals are common. There must be only one link used per channel.

Min sensor / control signal cable size 7/0.2mm
The screen must be earthed at controller end only

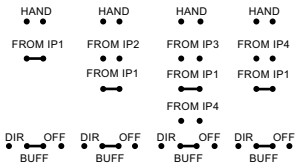
Max length 100m.
Keep sensor/control signal wires away from power cables/units which may cause interference.

Screened cable is recommended.

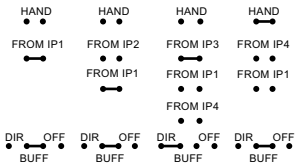
EXAMPLES :



Each output buffered and adjusted by pot.



All outputs buffered and follow input 1.



Outputs 1 & 2 buffered and follow input 1.
Output 3 not buffered and follows input 3.
Output 4 buffered and follows pot.

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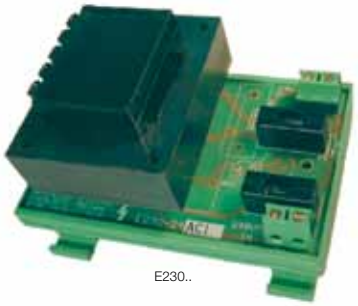
TRANSFORMERS

E230..

- Din rail mounting modules used to convert AC and DC voltages.



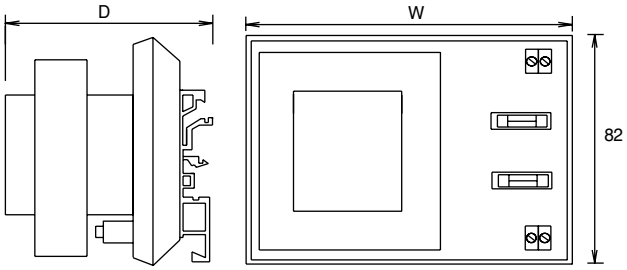
Max Ambient -10/+50 C
Terminals 0.5-2.5mm rising clamps
Flammability = UL94-V0
If fitting inside an enclosure,
ensure adequate ventilation is
provided as these units can become hot.

Type	Input ±10%	Output ±15%	Primary Fuse Rating	Secondary Fuse Rating	VA	Mounting	Enclosure
E230-24AC1	230VAC	24VAC	315mA (T)	1A (T)	25	Din Rail	IP00
E230-24AC2	230VAC	24VAC	315mA (T)	2A (T)	50	Din Rail	IP00
E230-24AC3	230VAC	24VAC	315mA (T)	3A (T)	75	Din Rail	IP00
E230-24DC1	230VAC	24VAC	315mA (T)	1A (T)	-	Din Rail	IP00

Power supplies with other outputs available to special order

DIMENSIONS

E230..



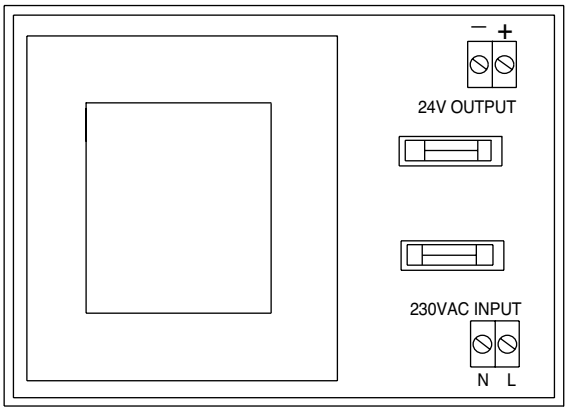
	W	D
E230-24AC1	113	78
E230-24AC2	113	85
E230-24AC3	130	90
E230-24DC1	113	78

ACCESSORIES: EE-M2T Wall mounting enclosure for E230-24AC1. 125H x 125 W x 75D Protection IP65

This enclosure has no ventilation – therefore do not use on loads above 20VA
DO NOT USE WITH OTHER TRANSFORMERS due to size and ventilation requirements

WIRING:

E230..



TIME SWITCHES

ETS..

These time switches can be used to control heating, lighting, appliances, etc.

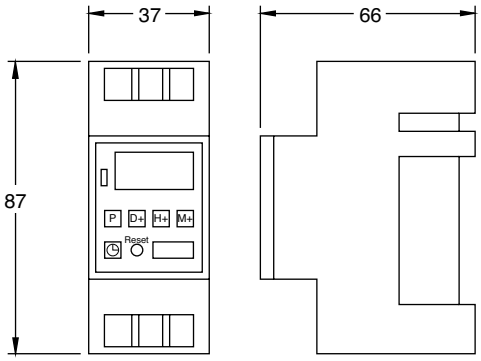
ETS-1CH

200 hrs battery reserve
24hrs & 7 days Program
LCD display
LED indicator
Din Rail Mounting
Operating temp: -10/+40oC
Minimum setting time: 1 minute
Current consumption: 4.4W
Life expectancy: 100000 operations
Accuracy +/-1 min per month

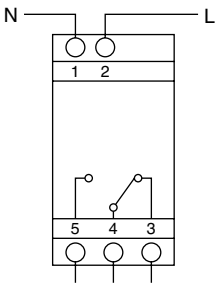
Type	Channels	Supply	Programs	Switch Rating	Protection
ETS-1CH	1	230VAC	8 ON/OFF programs / day	1 x 230VAC 16(8)A SPDT	IP30

DIMENSIONS

ETS-1CH



WIRING:



The live connector must be protected with a MCB or fuse of max 16A.

Connect the circuit to be controlled between terminals:
4 and 3 for a closing function
4 and 5 for an opening function

PROGRAMMING:

Setting the Programs
Settings can be programmed for a day or a block of days.
There are six block options:

Mo Tu We Th Fr Sa Su
Mo Tu We Th Fr
Sa Su
Mo Tu We Th Fr Sa
Mo We Fr
Tu Th Sa

Press the P (Prog.) button to set the first ON setting.
Press D+ (Day) button to select the desired day or block of days.
Then press the H+ (Hour) and M+ (Min.) buttons to set the time.
Once correct press the P button again to validate.
Now set the OFF setting the same way, pressing P to validate once correct.
Repeat for the remaining ON and OFF settings required.

When all the settings have been programmed press the 'clock' button and the timer is ready to operate.

Setting the Clock
Press the 'clock' button and hold, simultaneously press the:

D+ button until the correct day
H+ button until the correct hour
M+ button until the correct minute

Then release both buttons and the clock will be set.

Viewing and Changing Settings
Press P several times to view each setting and use the H+ and M+ buttons to make any time changes if desired, then press P to validate.

Resetting
To reset the timer press the 'reset' button. This will erase all clock and program settings.

Manual Override
Use the 'manual' button to override the program by pressing it several times to select, Permanent ON, Permanent OFF or back to Auto (Auto mode is the mode which uses the program settings).

Summer/Winter Changeover
To change from winter to summer time press the 'Hour' and 'Min.' buttons simultaneously. The clock will be set forward 1 hour and an "S" will appear in the display.
Repeat this procedure to select winter time.

Random Mode
To enter Random mode press the 'Day' and 'Hour' buttons simultaneously - an "R" will appear on the display.
The Random mode and programs will work at the same time separately.

ALARM INTEGRATOR

EAL..

EAL.. Provides a common alarm output for up to 9 separate alarm input signals. Parallel connection is possible for additional alarm inputs.

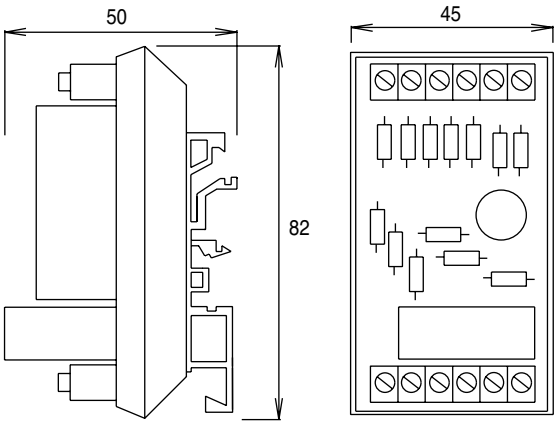
EAL..

Volt free contacts
Terminals 0.5-2.5mm rising clamps
Max ambient 50 C
Enclosure Flammability = UL94-V0

Type	Input	Max No of Inputs	Output Switch 230VAC SPST	Consumption	Mounting	Enclosure
EAL-24	24VAC	9	10(3)A	<1VA	Din Rail	IP00
EAL-110	110VAC	9	10(3)A	<1VA	Din Rail	IP00
EAL-230	230VAC	9	10(3)A	<2.5VA	Din Rail	IP00

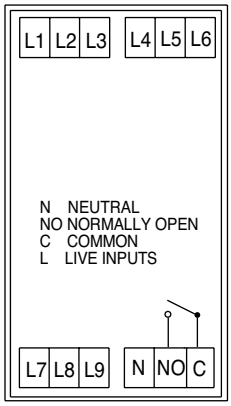
DIMENSIONS

EAL..



WIRING:

EAL..



When a signal is received on any input - volt free contacts C-NO close

All alarm inputs L1 to L9 must be same voltage and phase

The neutral must be common to all alarm inputs

Each input is isolated to prevent backfeed between inputs

Connect output C-NO in parallel to additional units if more than 9 inputs are required.

EMERGENCY PRODUCTS

REMOTE ALARM PANEL

ERA..

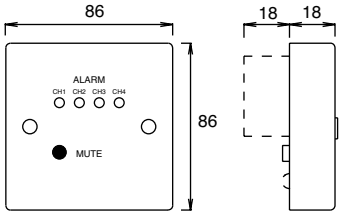
This product accepts a switched input 230 VAC, 24VAC/DC or a 0-10VDC adjustable input signal to provide an audible and visual alarm.

Flush Mounting
Fits square single gang BS box
Protrudes 18mm from wall
Buzzer 70dB at 1m
Enclosure Colour : White suitable for room mounting.
Enclosure Flammability = UL94-HB

Type	Description	Input ±15%	Supply	Operation	Consumption	Time Delay	Mounting	Enclosure
ERA-230	1 Channel	1 x 230VAC		Light & Buzzer	70mA	-	Flush	IP40
ERA-10-1	1 Channel	1 x 0-10VDC	24VAC/DC	Light & Buzzer	70mA	0-30s adj.	Flush	IP40
ERA-24-1	1 Channel	1 x 24VAC/DC		Light & Buzzer	70mA	0-30s adj.	Flush	IP40
ERA-10-2	2 Channel	2 x 0-10VDC	24VAC/DC	Light & Buzzer	70mA	0-30s adj.	Flush	IP40
ERA-24-2	2 Channel	2 x 24VAC/DC		Light & Buzzer	70mA	0-30s adj.	Flush	IP40
ERA-10-4	4 Channel	4 x 0-10VDC	24VAC/DC	Light & Buzzer	70mA	0-30s adj.	Flush	IP40
ERA-24-4	4 Channel	4 x 24VAC/DC		Light & Buzzer	70mA	0-30s adj.	Flush	IP40

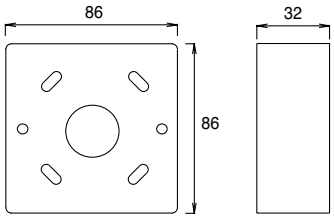
DIMENSIONS

ERA..

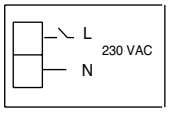


ACCESSORIES:

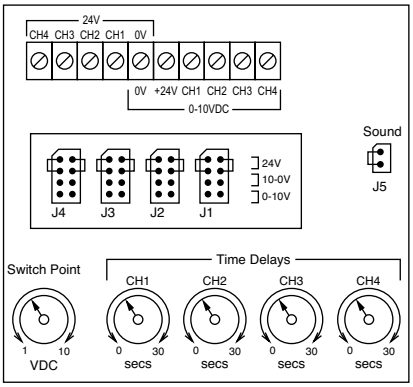
EE-BP5 Surface mounting backbox for ERA..



WIRING:



Drawing shows input terminals, links & time delays for all versions. These vary according to the model ordered.



ERA-230

Alarm condition is indicated by the LED and buzzer switching on.
Pressing the mute button switches off the buzzer.
The LED only switches off when the fault is rectified.

ERA-10/24

Link J1 - J4 settings:

If the alarm input is a 24V signal, position links here: 24V

If the alarm input is a rising 0-10VDC signal, position links here: 0-10V

If the alarm input is a falling 10-0VDC signal, position links here: 10-0V

For 24VAC/DC alarm wire 0V and the 24V switched inputs to CH1, CH2, etc.
For 0-10VDC alarm wire 0V and +24V and all 0-10VDC inputs to CH1,CH2, etc.
Fit link to 0-10 or 24V according to input required. For 0-10vdc the switch point is adjustable.
If the buzzer is not required, remove the SOUND link J5.
If using 0-10vdc input the unit can be set to switch on rising or falling signal via the links J1-J4.
The time delay allows a time period before the unit switches on thus preventing nuisance switching.
Set to zero if not required. Alarm condition is indicated by LED and Buzzer switching on.
Pressing the mute button switches off the buzzer.
The LED only switches off when the input returns to normal.
Terminals 0.5-2.5mm rising clamps Min signal cable size 7/0.2mm Max length 100m.
Screened cable is recommended. The screen should be earthed at controller end only.
Keep control signal wires away from power cables/units which may cause interference.

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PLANT EXTENSION TIMER 0-7 HOURS

EPX..

This device can be used to turn units on for a fixed time period or to extend the normal run time of a system.

EPX..

- Flush Mounting
- Fits single gang box
- Protrudes 18mm from wall
- Volt free contact
- Enclosure Colour : White - suitable for room mounting.
- Terminals 0.5-2.5mm rising clamps.
- Enclosure Flammability = UL94-HB

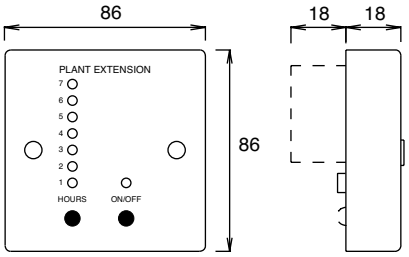
Type	Description	Supply ±15%	Output Switch 230VAC	Power Consumption	Indication	Time Setting	Enclosure
EPX-24	Plant Extension	24VAC	5(3)A SPST	1VA	LED	0 - 7 hrs	IP40
EPX-230	Plant Extension	230VAC	5(3)A SPST	2.5VA	LED	0 - 7 hrs	IP40

PLEASE NOTE NOW SINGLE GANG

For plant extension without adjustable run time see model EXU..

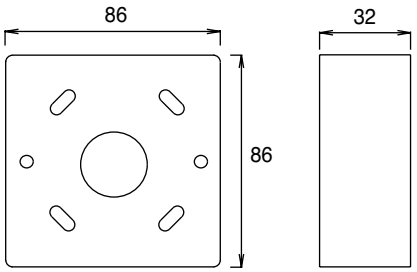
DIMENSIONS

EPX..



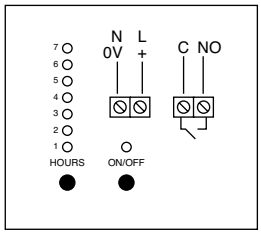
ACCESSORIES:

EE-BP5 Surface mounting backbox for EPX..



WIRING:

EPX..



Select the run time required by repeatedly pressing the HOURS button and the corresponding LEDs will turn on. These LEDs will also turn off in sequence during the countdown period. Push the ON/OFF button, contacts C-NO close and the ON/OFF LED turns on to indicate run time has been extended.

When the selected time period expires, contact C-NO opens and the ON/OFF LED turns off.
The ON/OFF button can be pressed at any time to stop the extended run time - contact C-NO will open and all LEDs will turn off.

PLANT EXTENSION UNIT

EXU..

This unit can be wired to a time switch or other device to extend the normal running time of a system.

EXU..

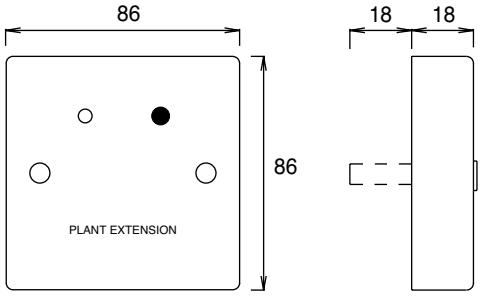
Flush Mounting
Fits single gang BS box
Protrudes 18mm from wall
Enclosure Colour : White - suitable for room mounting.
Enclosure Flammability = UL94-HB

Type	Description	NEON Voltage	Indication Light	Push Button 24/230VAC	Enclosure Setting
EXU-24	Plant Extension	24VAC	NEON	0.5A	IP40
EXU-230	Plant Extension	230VAC	NEON	0.5A	IP40

For adjustable run time 0-7 hours, see model EPX..

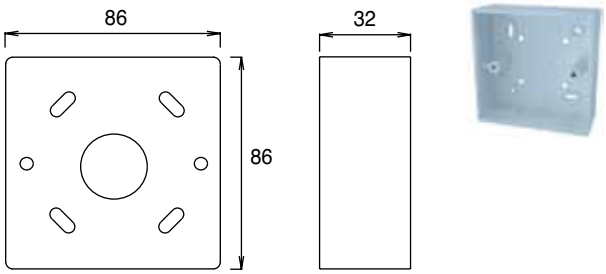
DIMENSIONS

EXU..



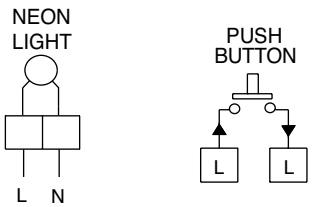
ACCESSORIES:

EE-BP5 Surface mounting backbox for EXU..



WIRING:

EPX..



When the momentary action push button is pressed a circuit is made.
This can be wired to a time switch which extends the plant running time.
The NEON Light can be wired to show that running time has been extended.

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FIREMANS SWITCH

EFM.. EKFM

Firemans Switch for remote override of ventilation plant in the event of fire. All standard types have red colour enclosures.

EXU..

EFM-1
Fits square outlet box
Protrudes 20mm from wall.
Enclosure Flammability = UL94-V0

EFM-4/5
Enclosure Flammability = Metal

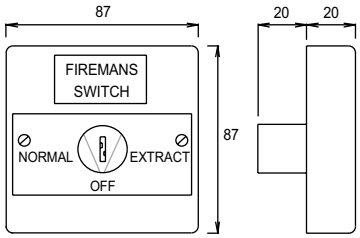
EKFM
Transparent Plastic lid.
Enclosure Flammability = UL94-HB

Type	Description	Mounting	Switch rating 230VAC	Operation 3 position	Enclosure Setting
EFM-1	Key Operated (includes 2 keys)	Flush	2 x 10(2)A SPST Volt Free	Normal - Off – Extract	IP40
EKFM	Keyguard for EFM-1	Surface	Once fitted, break lid to access key - see accessories for replacement		IP00
EFM-4	Knob Operated (safe breakglass)	Surface	1 x 10(2)A SPDT Volt Free	Normal - Off – Extract	IP43
EFM-5	Knob Operated (safe breakglass)	Flush	1 x 10(2)A SPDT Volt Free	Normal - Off – Extract	IP40

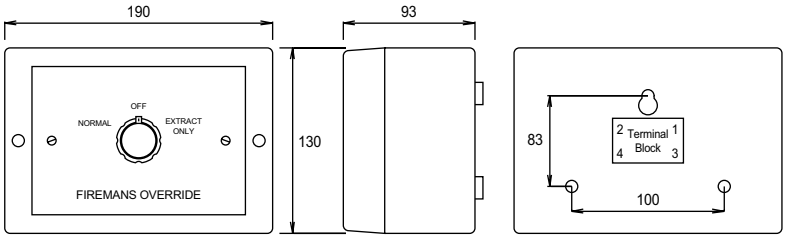
Special Versions available on request.

DIMENSIONS

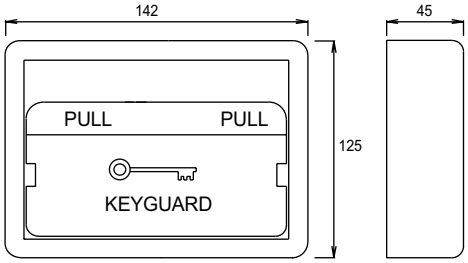
EFM-1



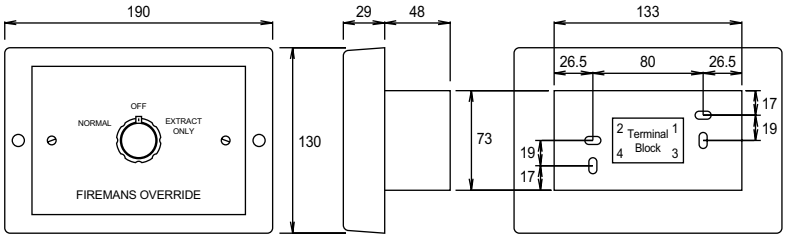
EFM-4



EKFM

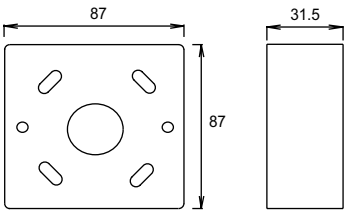


EFM-5

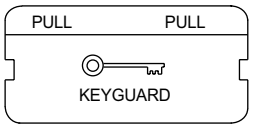


ACCESSORIES:

* **EE-BP6 -** Surface mounting backbox for EFM-1

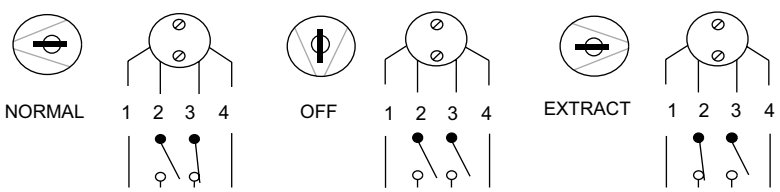


EE-KF - Replacement Lid for EKFM 4 per packEFM-1

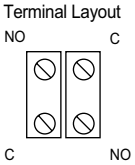


WIRING:

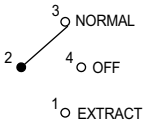
EFM-1



Terminal Layout



EFM-4/5



EMERGENCY PRODUCTS

DUCT SMOKE DETECTORS

RWE..

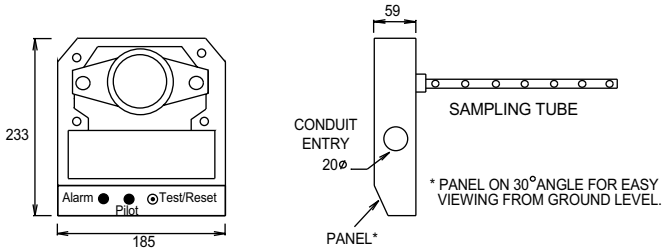
- Detects smoke / combustion products in air moving through HVAC ducts. Ionisation Model - detects small smoke particles 0.1-1 micron and combustion gases as in fast burning fires. Photoelectric Model - best suited to detect large smoke particles 1-10 micron e.g. PVC insulation, fabrics & furnishings.

Humidity 10% to 85% RH no condensation
Ambient temp: RWE-N 0-70°C
RWE-P 0-60°C
Volt Free Contacts
Power Consumption:-
Standby: 230VAC 12mA 24VAC 35mA 24VDC 15mA
Alarm: 230VAC 16mA 24VAC 74mA 24VDC 56mA
Remote test & reset facility
Alarm indication light — Steel Backbox
Plastic ABS cover — Terminals 0.5-2.5mm²
Enclosure Flammability = UL94-V0

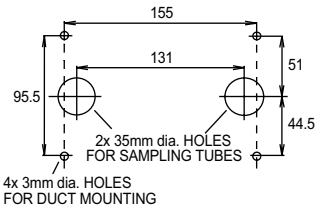
Type	Detector head	Supply ± 10%	Fault Contact SPDT	2 x Alarm Contacts 230VAC	230VAC	Air Velocity min	m/s max	Enclosure
RWE-N	Ionisation	230 VAC or 24VAC/DC	5(2)A 230VAC	10(2)A SPDT	10(2)A SPDT	1.5	20	IP43
RWE-P	Photoelectric	230 VAC or 24VAC/DC	5(2)A 230VAC	10(2)A SPDT	10(2)A SPDT	1.5	20	IP43
	INCLUDES 150MM SAMPLING TUBE							
ST750	750mm	Sampling Tube						
ST1500	1500mm	Sampling Tube	ORDER SAMPLING TUBE ACCORDING TO DUCT WIDTH & CUT TO SUIT					
ST3000	3000mm	Sampling Tube						

DIMENSIONS

RWE..

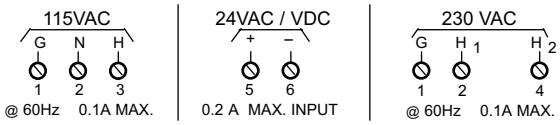


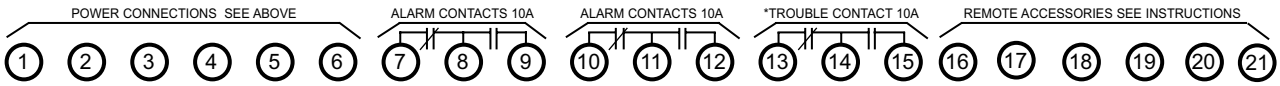
DRILLING DETAIL



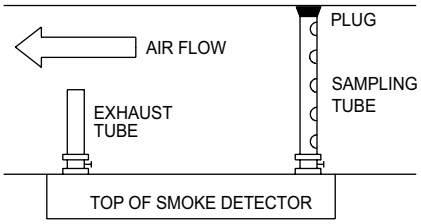
WIRING:

Power Connections





INSTALLATION:



Fit the sampling tube across the entire width of the duct.
The tube can be cut to the required length. Minimum duct width 200mm.
FIT THE PLUG PROVIDED TO THE END OF THE SAMPLING TUBE.
The holes in the sampling tube should face towards the air flow.
ΔP between input & exhaust tubes should be between 0.024 to 3.0 mbar
An exhaust tube is provided – this must not be blocked.
The tubes & air flow direction can be reversed.

To prevent false alarms, avoid mounting in areas of extreme high/low temperature, in areas of high humidity or a dusty environment.
The unit should be mounted in a straight duct away from bends or other deflections or turbulent areas.

OPERATION:

Normal / Power On	Pilot light on. Fault contacts 14 - 15 close. Alarm light off. Alarm contacts 8-9 & 11-12 open.
Smoke / Power On	Pilot light on. Fault contacts 14 - 15 close. Alarm light on. Alarm contacts 8-9 & 11-12 close.
Detector Out/ Power Off	Pilot light off. Fault contacts 14 - 13 close. Alarm light off. Alarm contacts 8-9 & 11-12 open.
Testing	By keeping the reset/test button depressed a smoke condition is simulated.
Resetting	Allow approximately 5 minutes for the smoke to clear from the detector head and then press and release the reset/test button. The unit returns to a normal condition.

MAINTENANCE: Periodically clean the tubes & detector head by vacuuming or blowing with compressed air. Do not use chemicals.

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RAIN / WATER / LEAK DETECTOR

EW..

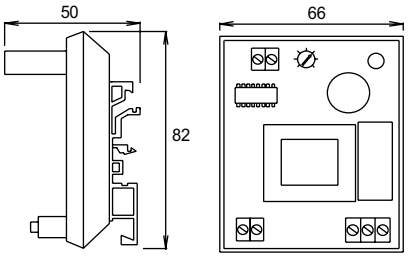
- Detects conductive non corrosive liquid/water in plant rooms, boiler houses, under floors, roofs etc. DO NOT use with combustible liquids ie fuels. AC sensor excitation is used for reliable operation which eliminates the sensor degradation problems found with DC systems.

- Volt free contacts
- Max ambient 70°C
- Adjustable sensitivity
- LED indication - light ON when the sensor is wet.

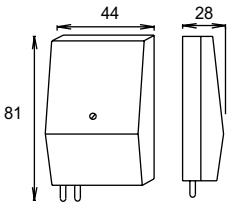
Type	Unit	Supply ± 15%	230 VAC SPDT	Power Consumption	Maximum No of Sensors EW-01	EW-03	EW-06	Mounting	Enclosure
EW-230	Switch unit	230VAC	10(3)A	<2.5 VA	10 in parallel	200m	6	Din Rail	IP00
EW-24	Switch unit	24VAC	10(3)A	<1.4 VA	10 in parallel	200m	6	Din Rail	IP00
					Max cable length from the switch unit 200m				
EW-01	Probe Sensor	For use with above switch unit		2 wire	Box can be fitted in various locations			IP40	
EW-03	Cable Sensor	For use with above switch unit		2 wire	3mm dia (Max 200m)		**ORDER PER METRE**		IP00
EW-06	Rain Sensor	For use with above switch unit		4 wire	2 sensor & 2 heater wires 24VAC 1 watt				IP65
					24VAC Transformer Available)				

DIMENSIONS

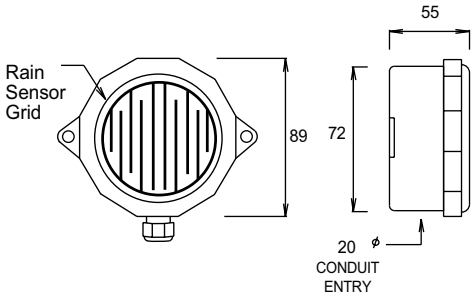
EW-230 / EW-24



EW-01



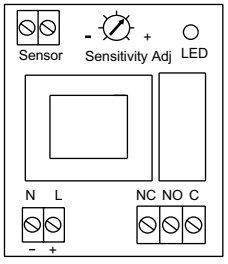
EW-06



ACCESSORIES: **EE-M1T** Enclosure for EW-230 and EW-24 Dims : 125 H x 75 W x 75 D IP65 Enclosure Flammability UL94- -V2

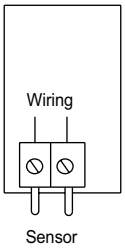
WIRING:

EW-230 / EW-24



Sensor Dry = C - NC, Sensor Wet = C - NO

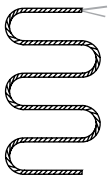
EW-01



DO NOT USE SCREENED CABLE.

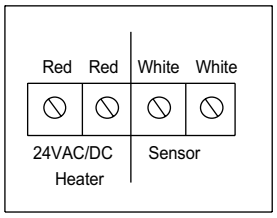
EW-03

Use the 2 bare metal wires as shown.
Do NOT connect the 2 PVC coated wires.



Before laying the cable ensure damage has not been caused by handling - make a continuity test across the 2 bare metal wires which should be open circuit.

EW-06



Polarity is not important

INSTALLATION:

Terminals 0.5-2.5mm² Max combined length 200m including sensor cable. Sensitivity may need reducing with long runs. DO NOT USE SCREENED CABLE. SENSOR CABLE MAY BE EXTENDED USING STANDARD PVC CABLE 7/0.2mm

EW-230/24 With power on and sensor connected, adjust sensitivity until LED is on, then turn back until LED just switches off. Short circuit the sensor at the furthest point from the switching unit. The LED and relay should switch on. To short circuit the sensor, press wet fingers or tin foil on to the sensor.

EW-01 The switch operates when the liquid touches both probes.

EW-03 The cable senses at any point along its entire length. Dirt on the cable can affect the switching. Fix the cable into position using plastic clips. Separate the two bare metal wires & connect them to the switching unit via standard 2 core unscreened PVC cable. DO NOT connect the 2 sensor PVC coated wires to the switching unit. Insulate any metallic parts before laying the sensor cable.

EW-06 The heater can be used to dry the surface after rainfall and to prevent false alarms when dew forms. Mount the unit at approx 45° to allow rain to fall off. Keep the sensor grid clean and protect from birds.

CONDENSATION SENSOR CHILLED CEILINGS / BEAMS

ECB-02

- Used to prevent 'indoor rain' with chilled beam / ceiling systems etc by detecting the early onset of condensation. Condensation is detected by a specially treated sensing element fixed directly to an aluminium sensing plate.

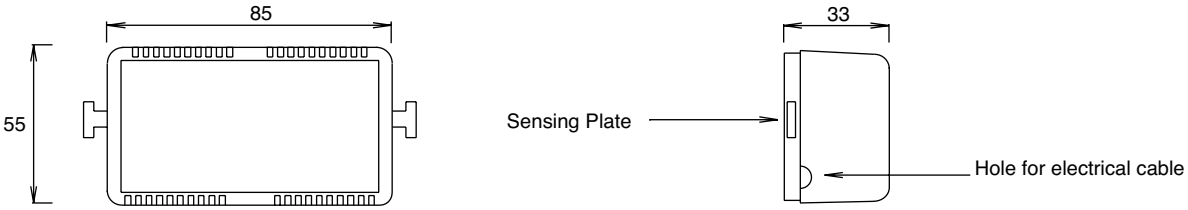
ECB-02

- Volt free contacts
- Max ambient 0-60 C
- Accuracy ± 3%
- Screw Terminals 0.5-2.5mm
- For chilled ceilings recommended setting is approx 80%
- Enclosure Flammability = UL94-V0

Type	Description	Operation	24V SPDT	Enclosure
ECB-02	Switch & sensor	Switch closes on detection of moisture and opens when dry.	5(2)A	IP30

DIMENSIONS

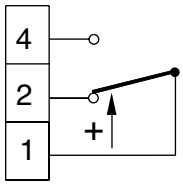
ECB-02



The set point adjuster is under the cover.

WIRING:

ECB-02



On detection of condensation contacts 1-2 open and 1-4 close.

INSTALLATION: The unit should be mounted directly onto the coldest part of the pipe/beam.

The unit can be fixed into position by using the cable ties around the mounting bracket. Ensure that good thermal contact is maintained between the sensing plate and the pipe/beam. Do not allow any space between the contact area.

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ROOM / DUCT HUMIDISTATS 1-2 STAGES

EHR.. EHD..

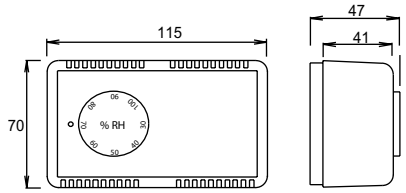
To monitor humidity in rooms or ducts and switch extract fans, alarms, humidifiers or de-humidifiers etc in the event of high or low humidity level. Any combination of humidifying or de-humidifying is possible.

Volt free contacts Max. air velocity 15 m/s
Terminals 0.5-2.5mm² Accuracy ± 3%RH
Media Temp. 0-60°C 0-100% RH non-condensing.
Sensing element - Specially treated plastic strands which do not require regeneration.
EHR.. If humidity level exceeds 85%RH, a low voltage supply is recommended.
Not suitable for aggressive dirty or dusty media.
Enclosure Flammability:
EHR.. = UL94-HB EHD.. = UL94-V0

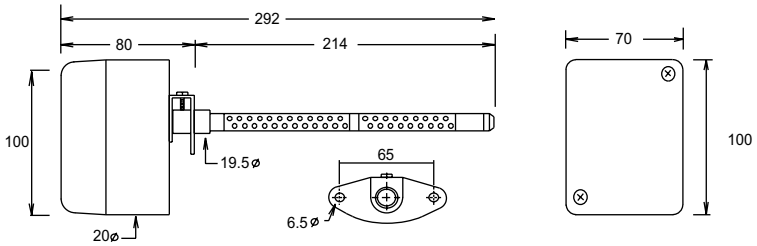
Type	Mounting	Stages	Range % RH	Difff. per Stage	Diff. between Stages	230VAC SPDT	Adjustment	Enclosure
EHR-1	Room	1	30/100	4%	-	5(2)A	Concealed	IP30
EHR-2	Room	2	30/100	4%	2/15% adj.	2 x 5(2)A	Concealed	IP30
EHR-1V	Room	1	30/100	4%	-	5(2)A	Knob	IP30
EHR-2V	Room	2	30/100	4%	2/15% adj.	2 x 5(2)A	Knob	IP30
EHD-1	Duct	1	30/100	4%	-	15(4)A	Concealed	IP54
EHD-1W	Duct	1	30/100	4%	-	15(4)A	Concealed	IP65
EHD-2	Duct	2	30/100	4%	3/18% adj.	2 x 15(4)A	Concealed	IP54

DIMENSIONS

EHR..



EHD..

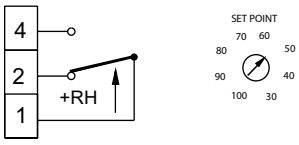


ACCESSORIES:

EE-RAD Radiation /Weather shield for EHD
To protect from direct sunlight/weather conditions.
Install vertically as shown only

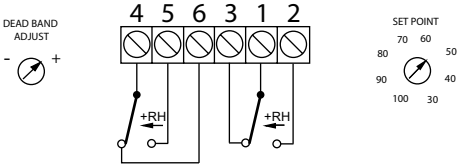
WIRING:

EHR-1



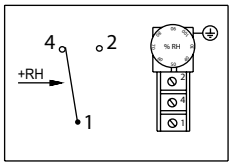
Humidity rise to scale setting - contact 1 - 4 close.
Humidity fall (diff) - contact 1 - 2 close.
Humidifying Only : Contacts 1-2
Dehumidifying Only : Contacts 1-4

EHR-2



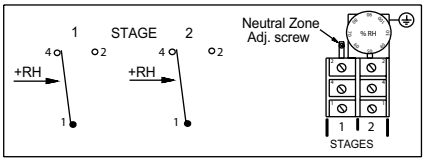
Stage 1 - humidity rise to scale setting contact 1 - 3 close 1 - 2 open.
Stage 2 - humidity rise above neutral zone, contact 4 - 6 close 4 - 5 open.
Humidifying Only : Contacts 1-2 & 4-5
Dehumidifying Only : Contacts 1-3 & 4-6
Hum & Dehum: Hum stage 1 & De-hum stage 2

EHD-1



Humidifying Only : Contacts 1-4 & 1-4
Dehumidifying Only : Contacts 1-2 & 1-2
Hum & Dehum: Hum stage 1 & De-hum stage 2

EHD-2



Humidity rise to scale setting - contact 1 - 2 close.
Humidity fall (diff) - contact 1 - 4 close.

Stage 1 - humidity rise to scale setting contact 1 - 2 close 1 - 4 open.
Stage 2 - humidity rise above neutral zone contact 1 - 2 close 1 - 4 open.

HUMIDITY

HUMIDITY & TEMPERATURE TRANSMITTERS 0-10VDC / 4-20MA ROOM / DUCT

EHRT.. EHDT..

These products can be used to monitor humidity or humidity + temperature inside rooms or ducts and give a 0-10vdc/4-20mA output signal linear across the measuring range.

The humidity sensor is capable of remaining stable in saturated conditions 100% RH for short periods. Suitable for use in HVAC & BMS systems.

Humidity..
0-100% RH non-condensing.

Accuracy <2%RH
Linearity and reproducability <0.5%RH at 25 C
Long term stability <2%RH, 12 months

Temperature..
Accuracy <1°C
Linearity <0.5%
Max media -20/+70°C

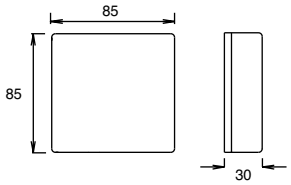
Enclosure Flammability EHRT.. UL94-HB
EHDT.. UL94-V0

Type	Mounting	Range %RH		Range °C	Supply ±15%	Output Signal	Load	Consumption mA	Enclosure
EHRT-2	Room	0/100		-	24VAC/DC	0-10vdc	>10KΩ	25	IP30
EHRT-3	Room	0/100		-	24VDC	4-20mA loop	< 600 Ω	30	IP30
EHRT-4	Room	0/100	&	-10/+50	24VAC/DC	2x 0-10vdc	>10KΩ	50	IP30
EHRT-5	Room	0/100	&	-10/+50	24VDC	2x 4-20mA loop	< 600 Ω	60	IP30
EHDT-6	Duct	0/100		-	24VAC/DC	0-10vdc	>10KΩ	25	IP65
EHDT-7	Duct	0/100		-	24VDC	24VDC	<600 Ω	30	IP65
EHDT-8	Duct	0/100	&	-10/+50	24VAC/DC	2x 0-10vdc	>10KΩ	50	IP65
EHDT-9	Duct	0/100	&	-10/+50	24VDC	2x 4-20mA loop	< 600 Ω	60	IP65

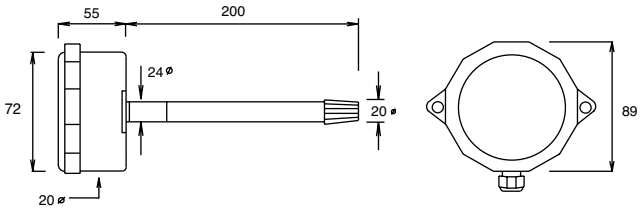
OPTIONAL **NTC/PT** sensor for two wire temperature resistance output. Available on EHRT-2/3 and EHDT-6/7 models only
Add suffix of sensor required 10K3A1 10K4A1 PT100 PT1000 etc. ie EHRT-2/10K3A1/A, EHDT-6/10K3A1

DIMENSIONS

EHRT..



EHDT..



Can be mounted on square or round outlet box
In areas of high humidity use the duct model and mount with probe facing downwards
Not suitable for dirty, dusty or aggressive media.

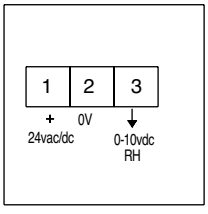
Install the probe at any angle horizontal to downwards.

ACCESSORIES:

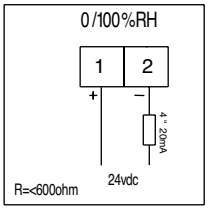
EE-RAD Radiation /Weather shield for EHD
To protect from direct sunlight/weather conditions.
Install vertically as shown only

WIRING:

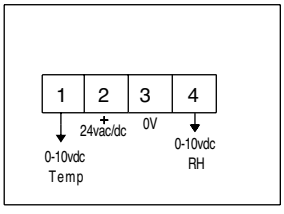
EHRT-2
EHDT-6



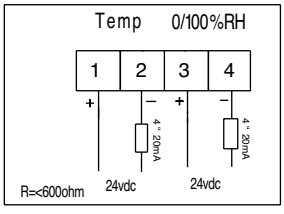
EHRT-3
EHDT-7



EHRT-4
EHDT-8



EHRT-5
EHDT-9



INSTALLATION: Min sensor / control signal cable size 7/0.2mm Max length 100m. Keep away from power cables/units which may cause interference.
Screened cable is recommended. The screen should be earthed at controller end only. Terminals 0.5 - 2.5mm

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LIGHT LEVEL TRANSMITTERS 0-10VDC

ELT..

- Senses light level and transmits a 0-10VDC signal linear across the selected range. Suitable for use with Building Management Systems.

Room sensor can be mounted on round or square outlet box.

Consumption < 30mA

Load Resistance >10KΩ

Accuracy ± 3%

Enclosure Flammability:

ELT-4R = UL94-HB

ELT-4W = UL94-V0

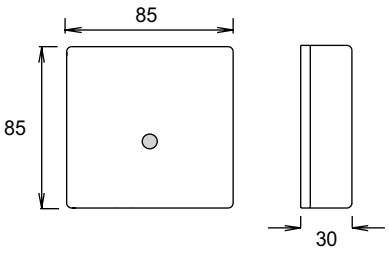
Type	Selectable Range Lux	Supply ± 10%	Output Signal	Vision Angle	Mounting	Enclosure mA
ELT-4R	10/2000, 10/4000, 10/10000, 10/20000	24 VAC/DC	0-10VDC	120°	Room	IP30
ELT-4W	10/2000, 10/4000, 10/10000, 10/20000	24 VAC/DC	0-10VDC	120°	Outside	IP65

Approx Lux levels :

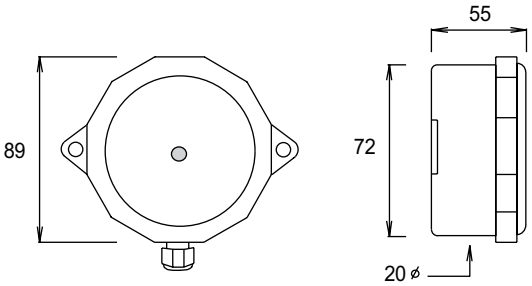
Average daylight	2000	Bright Sunlight	20000+
Minimum for Outdoor Areas	25	External walkways/Car Parks	50
Internal Warehouse Areas	150	Office/Retail Areas	500
Minimum task lighting	200	Precision Tasks ie assembly, machine operation	1500
Dusk	15 to 20		

DIMENSIONS

ELT-4R

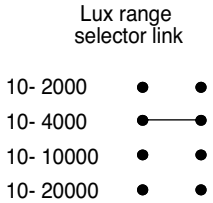


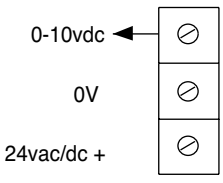
ELT-4W



WIRING:

ELT..





INSTALLATION: Terminals 0.5 -2.5mm | Min sensor / control signal cable size 7/0.2mm | Max length 100m

Screened cable is recommended | The screen should be earthed at controller end only

Keep sensor/control signal wires away from power cables/units which may cause interference.

OCCUPANCY

P.I.R. OCCUPANCY DETECTORS CEILING MOUNTED

EO-C..1

These units are used for lighting control and designed to be installed into ceiling tiles. They can be connected to control circuits or BMS systems. The EO-CL1 has an in-built adjustable lux sensor which will switch on the lighting only when ambient light falls below the pre-set level and movement is detected. The time delay prevents nuisance switching and is reset whenever movement is detected.

EO-C..1

Terminals 0.5-2.5mm
Enclosure Flammability = UL94-V0

Lights switch on when movement is detected.

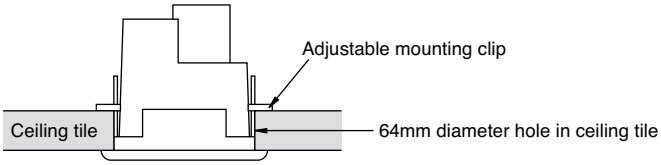
EO-CL1
In-built adjustable lux sensor
Set Lux to max. if it is not required.
Range: 10-2000 LUX.

Type	Ceiling Mounting	Supply Voltage	Switch Rating 230VAC ±10%		Movement Time Delay	Enclosure mA
EO-CO1	Flush	12-24VAC/DC	6A Incandescent 6A Fluorescent	6A SPDT Resistive	10s - 30 mins	IP40
EO-CL1	Flush	12-24VAC/DC	6A Incandescent 6A Fluorescent	6A SPDT Resistive	10s - 30 mins + **lux sensor**	IP40
EE-BP12	Surface Mounting Back Box					

INSTALLATION: Install the unit at least 1m away from any lighting source. Do not mount onto a vibrating surface.

DO NOT MOUNT IN DIRECT SUNLIGHT OR NEAR HEAT SOURCES. In larger areas wire more switches in parallel to power the load.

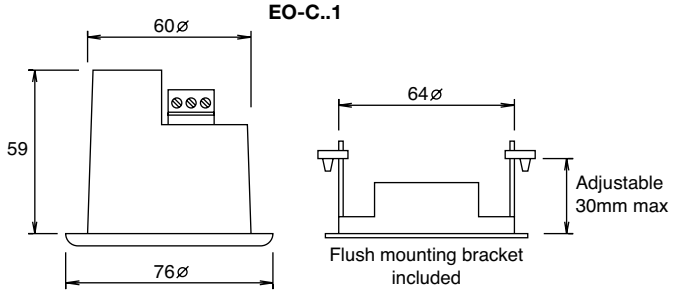
Flush Mounting: The occupancy detectors may be flush mounted through a 64mm diameter hole in the ceiling. Use the plastic mounting bracket and clips supplied to fix the flush mounted detector.



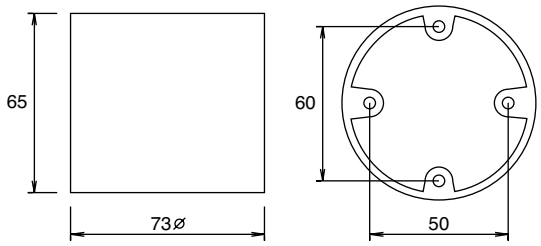
Surface Mounting: Alternatively the detectors can be surface mounted using the optional Back Box, which may be screwed to the ceiling.

DIMENSIONS

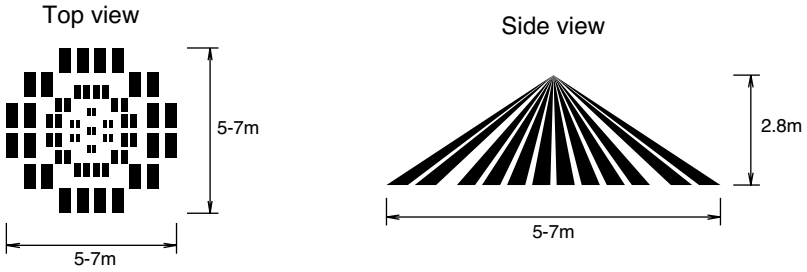
EO-C..1



EE-BP12 - Surface mounting back box

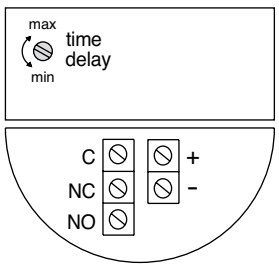


DETECTION FIELD:

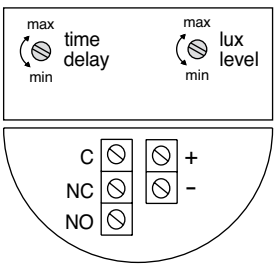


WIRING:

EO-CO1



EO-CL1



Time Delay Setting (EO-CO & EO-CL):
Timing is adjustable between 10secs to 30mins using the screwdriver slot labelled TIME.

LUX Setting (EO-CL only):
The LUX level can be adjusted using the screwdriver slot labelled LUX. Turning towards maximum allows the lights to come on at a higher ambient light level (set fully to maximum, lights will be activated regardless of ambient level).

On movement C-NO closes
No movement C-NO opens (after time delay)

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P.I.R. OCCUPANCY DETECTORS

EO..

These units are used for lighting control. They can be connected to control circuits or BMS systems. The EO-NF has an in-built adjustable lux sensor which will switch on the lighting only when ambient light falls below the pre-set level and movement is detected. The time delay prevents nuisance switching and is reset whenever movement is detected

EO-S.. / EO-V..

EO-NF

Terminals 0.5-2.5mm²
Enclosure Flammability = UL94-V0

EO-NF
Directly replaces a light switch
No neutral connection is required.
Manual On-Off switch.
In-built adjustable lux sensor
Set Lux to max. if it is not required.

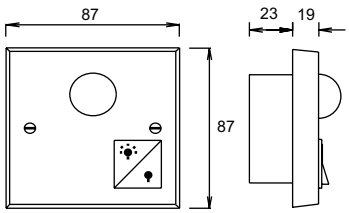
EO-NF / SF / SC
Suitable for direct connection to lights.

EO-VF / VC
Suitable for use with BMS systems
Volt free contacts
Flush mounting units fit square BS box
Unit protrudes 19mm + bulb from wall.

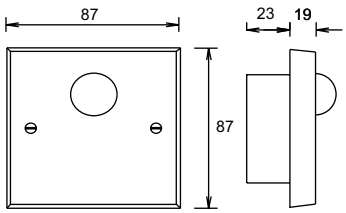
Type	Ceiling Mounting	Supply Voltage	Switch Rating 230VAC ±10%	Movement Time Delay	Enclosure mA
EO-NF	Flush	Switched live + on/off switch No neutral required	10A Incandescent 6A Compact Fluorescent 6A Fluorescent with Power Factor Capacitor	5 - 60 mins + lux sensor	IP40
EO-SF	Flush	Switched live Neutral required	10A Incandescent 6A Fluorescent 16A Resistive	10s - 60 mins	IP40
EO-SC	Ceiling	Switched live Neutral required	10A Incandescent 6A Fluorescent 16A Resistive	10s - 30 mins	IP40
EO-VF	Flush	live & neutral + SPDT	7A Resistive	10s - 60 mins	IP40
EO-VC	Ceiling	live & neutral + SPDT	7A Resistive	10s - 60 mins	IP40
OPTIONAL		**L24 =** 24VAC supply			

DIMENSIONS

EO-NF

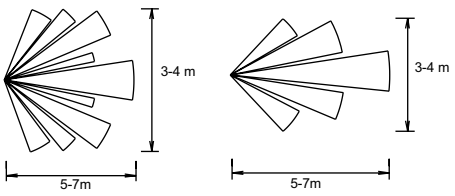


EO-SF / EO-VF / EO-SC / EO-VC

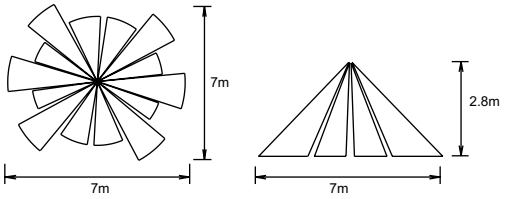


DETECTION FIELD:

WALL MOUNTED



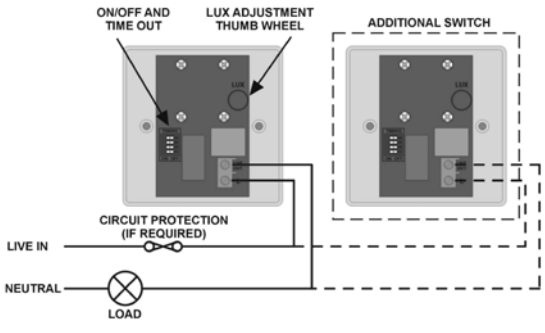
CEILING MOUNTED



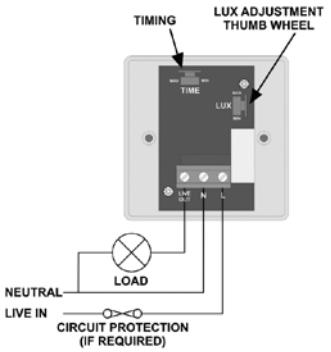
DO NOT MOUNT IN DIRECT SUNLIGHT OR NEAR HEAT SOURCES. In larger areas wire more switches in parallel to power the load.

WIRING:

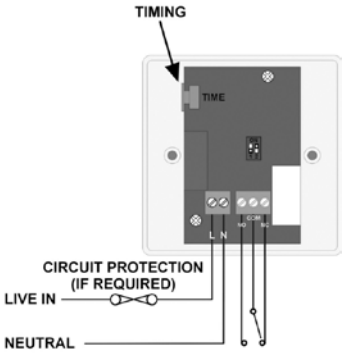
EO - NF



EO - SF / SC



EO - VF / VC



OCCUPANCY

MICROWAVE OCCUPANCY DETECTORS

MWS1

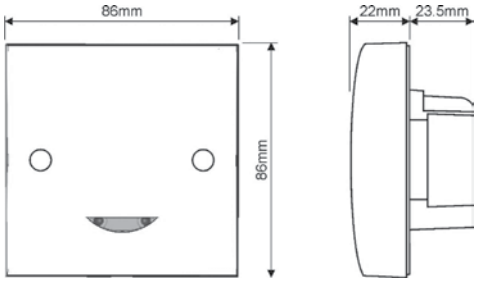
These detectors detect movement within its range and can be used to control lighting, heating or water shut off functions. An adjustable integral light level sensor will inhibit the switching on of lights if the ambient lighting is already sufficient. Adjustment of light level, time delay and sensitivity is by a hand held programming handset **UHS5** which should be ordered at the same time.

MWS1

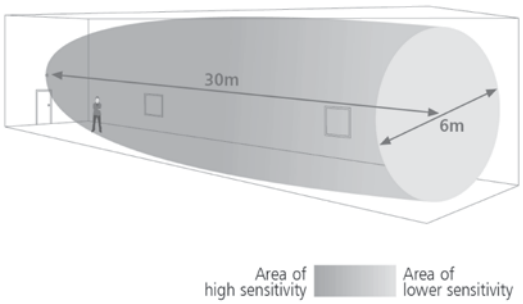
Size 86x86x22 projecting from wall.
Adjustable time delay 10 secs to 99min.
Terminals 2.5mm².
Casing flame retardant ABS class 2.
Wall mount 1.2 to 1.5 metres from floor.

Type	Mounting	Supply	Load	Power consumption
MWS1A-PRM	Flush, wall mounting	230VAC	10A	ON 1.15W OFF 790mW
MWS1A-PRM-LV	Flush,wall mounting	24VDC	16A resistive/ 10A inductive	ON 1.01W OFF 790mW
UHS5	Hand Set (Not included – Order separately)			

DIMENSIONS

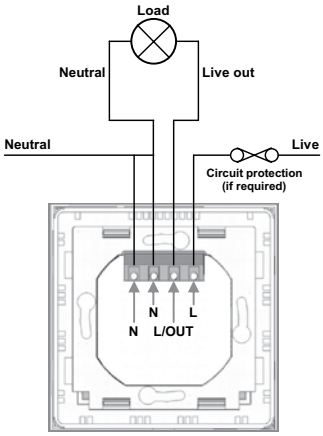


DETECTION PATTERN

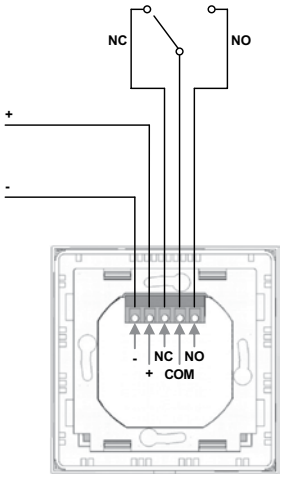


WIRING:

MWS1A-PRM



MWS1A-PRM-LV



INSTALLATION

Do not site within 1m of any lighting or ventilation equipment.
Do not fix to a vibrating surface.
Site as far as possible from the surface of metal objects.

PROGRAMMING USING THE HAND SET

Parameter Name	Default Value	Number of Shift key presses 0	1	2	3	UHS5 Handset Graphics	Description
		Button Activation					
On / Raise		On					Turn lights on.
Off / Lower		Off					Turn lights off.
Walk test	Off	On	Off				When set to On this causes a red LED to flash on the sensor when it detects movement. Use this feature to check for adequate sensitivity levels.
Time Out ***(Time adjustment)***	10 mins	1, 10 & 20 minutes	5, 15 & 30 minutes				Once the detector is turned on, this value sets how long the lights will stay on once movement has ceased.
Lux on level ***(Switch level on)***	9	2, 5 & 7	4, 6 & 9				Lux level setting to prevent the luminaires being switched on if the ambient light level is sufficient (adjustable between 1 and 9). The luminaires will always be switched on at level 9.
Lux off level ***(Switch level off)***	9	2, 5 & 7	4, 6 & 9				Lux level setting to switch the luminaires off during occupancy if the ambient light level goes above the setting (adjustable between 1 and 9). Level 9 will always keep the lights on. This setting can be used for "window row switching".
Sensitivity	9	1, 5 & 9	3, 6 & 8				Sensitivity level for detecting movement. 1 = low sensitivity 9 = high sensitivity
Defaults				D			Returns the unit to the default settings.
Presence / Absence	Presence	Presence	Absence				Absence mode not implemented—do not use.
Shift							Use this button to select the settings in red and blue signified by the 'Shift 1' and 'Shift 2' LEDs

Point the hand set at the Sensor and send the required programming commands to the unit as shown below. Valid commands will be indicated by a green LED flash.

NOTES:

The microwave radiation emitted by these units is of extremely low power. At a distance greater than 50mm the power density is less than 6% of the ANSI IEE C95.1-1991 power density. At a distance of 5mm from the unit it is less than 84% of the recommended power density.

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GAS DETECTOR/TRANSMITTER

EGS-...

- This range of gas detectors can be used to detect leaks and provide an alarm in general commercial and industrial applications.
- Can be used stand alone, with a BMS system or with a monitor panel.

Do not expose to extreme ambient or oily/dirty conditions.

24VAC supply, green power led.

Red led and sounder alarm.

Volt free alarm relay rating 1A-Factory set threshold.

Analogue output 0 to 10VDC or 4-20mA

Dimensions 86x120x53 180gm

Standard housing IP41

GAS SENSOR (SPECIFY GAS)

Type	Gas	Range	Relay set point
EGS-NG	Nat Gas (methane)	0 to 5,000ppm	2500ppm
EGS-LPG	LP Gas	0 to 2,000ppm	1000ppm
EGS-CO	Carbon monoxide	0 to 100ppm	30ppm
EGS-R134	Refrig R134	0 to 1000ppm	500ppm
EGS-H	Hydrogen	0 to 2,000ppm	1000ppm
EGS-CO2/IR	Carbon dioxide	0 to 10,000ppm	5000ppm
ECS-OZ	Ozone	0-1ppm	0.2ppm
EGS-O	Oxygen	0 to 25%	19%.
EGS-H2S	Hydrogen sulphide	0 to 30ppm	5ppm
EGS-SD	Sulphur dioxide	0 to 10ppm	2ppm
EGS-ND	Nitrogen dioxide	0 to 10ppm	3ppm
EGS-CL	Chlorine	0 to 10ppm	0.5ppm

Other gases-please enquire

Default setpoints are in accordance with www.hse.gov.uk/coshh/table1.pdf

OPTIONAL HOUSINGS

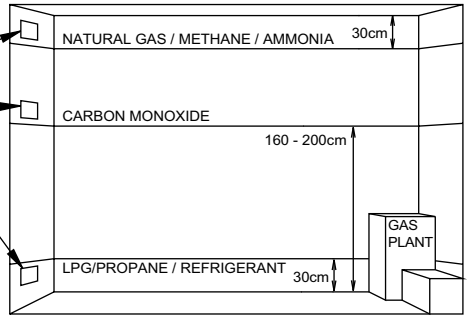
DUCT
EE-HSGDUCT

ROOM
EE-HSGIP66

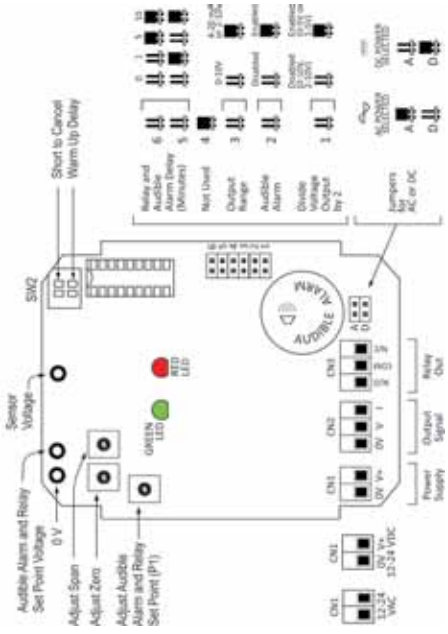
HAZARDOUS AREA
EE-HSGEx

INSTALLATION

The unit should be positioned at high/mid/low level depending on the density of the gas being detected.



WIRING



Use 2 cores of a 4 core 7/0.2mm sq cable

OPERATION

Do not connect the 0 volt terminals.
See the detailed instructions in the Product Data sheets supplied with the product.

MAINTENANCE

Keep the gas sensors energised and after installation or a period of non use energise the sensor for at least 15mins to allow it to stabilise.

Test annually or in accordance with the local regulations as detailed in the Product Data sheet.

Do not store of install in dusty dirty environments or areas of high solvent concentration.

AIR QUALITY & GAS SENSORS

GAS MONITOR PANELS

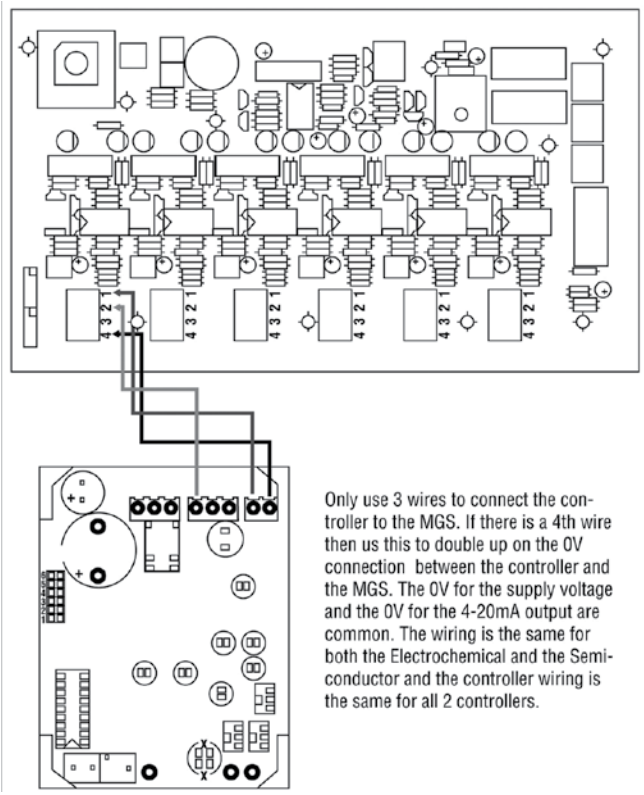
EGD-M./ST-MON350

This range of gas sensor monitor panels can be used with EGS or ST-.. gas sensors and provide a centralised display of sensor alarm status with visual and audible alarms. By choosing the appropriate sensor and monitor panel up to 65 sensors can be accommodated.

EGD - M

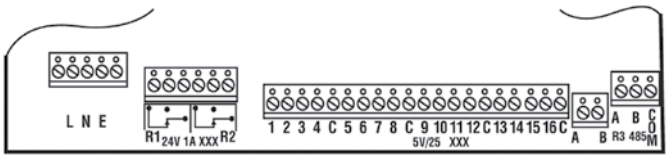
EGD-M1	EGS	1	230VAC	2	orange/red led	192x100x75
EGD-M2	EGS	2	230VAC	2	orange/red led	192x100x75
EGD-M4	EGS	4	230VAC	2	orange/red led	262x255x82
EGD-M6	EGS	6	230VAC	2	orange/red led	262x255x82
ST-MON350	ST-..only	up to 32	230VAC	2	240x64 graphic lcd	232x235x60
ST-MON 350R	ST-..only	from 32 to 65 sensors	230VAC	2	240x64 graphic lcd	232x235x60

WIRING EGS SENSORS TO EGD-M.. MONITOR PANELS



Only use 3 wires to connect the controller to the MGS. If there is a 4th wire then us this to double up on the 0V connection between the controller and the MGS. The 0V for the supply voltage and the 0V for the 4-20mA output are common. The wiring is the same for both the Electrochemical and the Semiconductor and the controller wiring is the same for all 2 controllers.

WIRING ST-.. SENSORS TO ST-MON350 MONITOR PANELS



The mains supply should be via a 2pole isolating switch fused at 1A.Use 3x0.75mm sq cable.

See the detailed instructions in the Product Data sheets supplied with the product.

INSTALLATION

Avoid extremely hot, cold or humid environments, strong magnetic fields or direct sunlight.

OPERATION

See the detailed instructions in the Product data sheets supplied with the product. .

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AIR QUALITY TRANSMITTER 0-10VDC

EAQ..

These products can be used to detect a mixture of pollutant gases in the air ie cigarette smoke, odours and other gases generally found within clubs, pubs, restaurants, kitchens, smoking areas etc. The 0-10vdc linear output signal is proportional to the contamination level produced and can be used to control fresh air dampers or fans etc. A solid state element is used to sense contaminant gases.

EAQ..Transmitters should not be used to detect Carbon Dioxide (CO2). CO2 transmitters are ideal for use in clean areas ie. theatres, conference rooms. SEE SEPARATE DATA SHEET ON CARBON DIOXIDE TRANSMITTERS.

EAQ-R1

Fits square or round outlet box.

Enclosure Flammability:

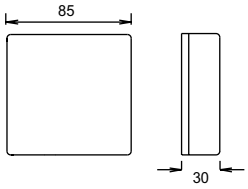
EAQ-R1 = UL94-HB

EAQ-D1 = UL94-V0

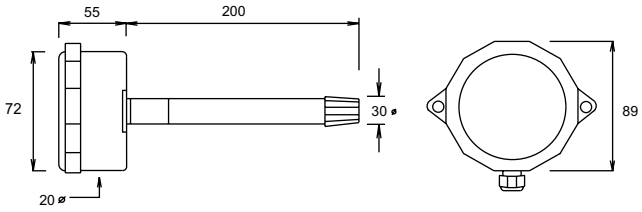
Type	Mounting	Supply ±15%	Output Signal	Load	Consumption mA	Ambient Temp °C	Accuracy Approx	Enclosure
EAQ-R1	Room	24VAC/DC	0-10vdc	>10 KΩ	<110	0/50	±5%	IP30
EAQ-D1	Duct	24VAC/DC	0-10vdc	>10 KΩ	<110	0/50	±5%	IP65

DIMENSIONS

EAQ-R1



EAQ-D1



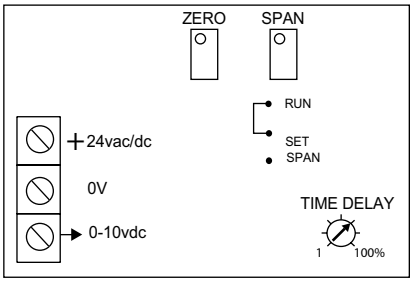
Room transmitters must not be used with excessively oily, dusty, dirty or aggressive m edia (see duct model). Mount approx 1.6 - 2m high, in an area with good air movem en t. Avoid areas of localised pollution, heat etc.

Install in the return air duct. Avoid ducts where excessive oily, dusty, dirty or aggressive media may be present ie, kitchens. In this case the duct transmitter should be wall mounted inside the kitchen. A filter is fitted to the probe to overcome minor dust, turbulence & velocity problems. Ensure that the filter does not become blocked.

Best results are achieved within controlled media temperatures between approx. 16 - 28°C.

At lower temperatures the output voltage may increase as temperature falls. Media Limits: 0 / +50°C 0-80% RH non-condensing.

WIRING:

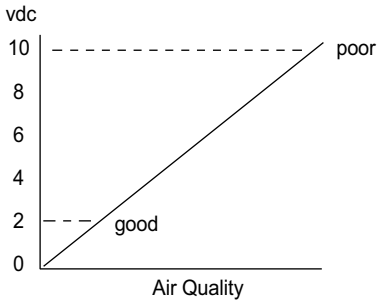


Link RUN for normal operation and 0vdc adjustment.

Link SET SPAN to adjust 8-10vdc.

Turn time delay to min when making adjustments.

OPERATION:



Allow approx 30 minutes for the device to stabilise after switching on. The sensing element will self-clean any dust which may have settled during storage. On initial power up the output will be 10vdc and this will reduce slowly during the self-cleaning process. On-site adjustments are not normally necessary. If any adjustments are required, they should only be carried out after the burn-in period, in clean air and with the time delay set to 0%. The following adjustments can then be made if necessary:

SPAN - Fit link to SET SPAN & adjust to 8-10V indicating bad air quality.

ZERO - Fit link to RUN and adjust to 0V when clean air is detected.

TIME DELAY - Set to 0% for fast response, 100% for slow response. This overcomes problems if the air quality changes for a short period. The response time will also be affected by air movement, temperature and contamination rates.

The transmitter output should be below 2vdc when little or no contaminant is present in the air ie in periods of low or no occupancy. Dampers can therefore be set to minimum fresh air or to close at approx 2vdc. As the air quality worsens the output signal increases to modulate the dampers to the fresh air position or to fully open at about 8-10vdc.

INSTALLATION: Terminals 0.5-2.5mm² Min sensor cable size 7/0.2mm Max length 100m. Screened cable is recommended. The screen should be earthed at controller end only Keep sensor wires away from power cables/units which may cause interference.

AIR QUALITY & GAS SENSORS

CARBON DIOXIDE TRANSMITTER 0-10VDC / 4-20MA

ECD..

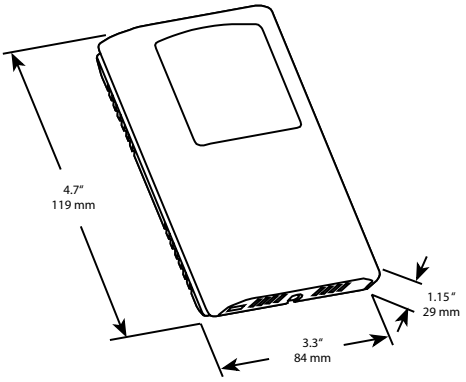
These devices detect the presence of Carbon Dioxide only and give a 0-10vdc or 4-20mA output signal linear across the range. Suitable for use in clean areas such as no-smoking rooms, theatres, conference rooms etc.

Sensing element : Non-dispersive Infra Red.
Repeatability ±20ppm
Sensor Accuracy 0-2000ppm ±75ppm
2min Response time
Calibration interval 3 years dependant on conditions.
Enclosure Flammability = UL94-HB

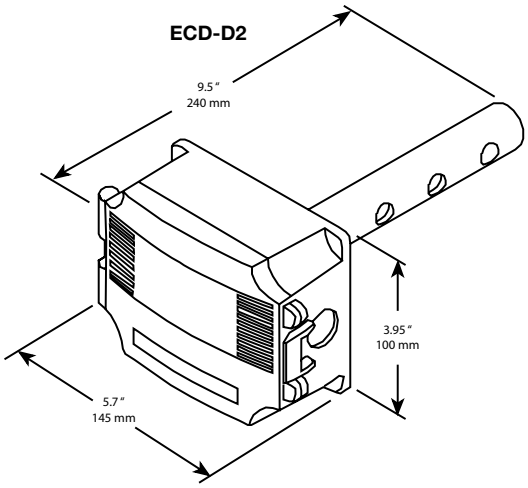
Type	Mounting	Range PPM Programmable	Supply ± 15%	Output Selectable	Consumption Max	Media Temp °C	Media Humidity %RH	Enclosure
ECD-R2	Room	1000-7500	24VAC/DC	0-10vdc/4-20mA	100mA	0/50	5/95	IP30
ECD-D2	Duct	1000-7500	24VAC/DC	0-10vdc/4-20mA	100mA	0/50	5/95	IP64

DIMENSIONS:

ECD-R2

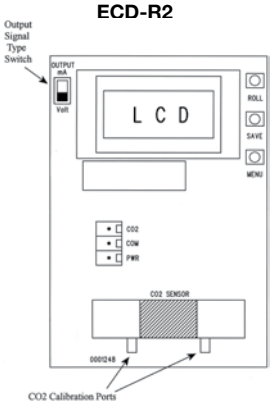


ECD-D2

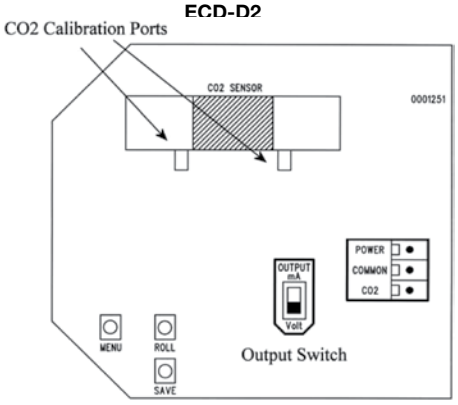


WIRING:

ECD-R2



ECD-D2



INSTALLATION:

ECD-R2 Install in a clean environment in an area with good air movement. Mount in g height 1.5 - 2m
Avoid areas of localised heat, windows, doors etc
ENSURE VENT HOLES ARE FACING DOWN.

ECD-D2 Install in a clean environment in the return air duct.
Position the unit away from heat sources.
The holes in the tubes should face parallel to the air flow.
The direction of air flow can be reversed.

SET UP USING THE MENU FUNCTION

Eight functions can be set up using the menu using the tree buttons
MENU To enter sey up or advance to the next step.
ROLL To change the programme variables.
SAVE To save to memory and advance to the next item.

Press MENU to enter the set up menu.

Out high Change the range between 1000 and 75ooppm.
Alititude Set to local altitude.
Auto Call Corrects sensor drift - ON if varing CO2 level.
OFF if constant CO2 level.

Out type Select 0-5VDC or 0-10VDC. If mA/Volt switch is set to mA then mA will be displayed.
Text
Calibrat Used for 1000ppm gas calibration.
Restore Defaults SAVe to restore defaults or MENU to exit.

Press SAVE to exit menu.

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WIND SPEED AND DIRECTION LEVEL

WIND SPEED AND DIRECTION SENSORS

EWS..

These products are suitable for measuring wind speed or wind speed and direction in such applications as automatic window closure in high wind conditions or general monitoring applications. They can be operated with zero power and are suitable for wiring into BMS systems.

Electrical connection 3m cable.

Max Ambient -20/+70°C

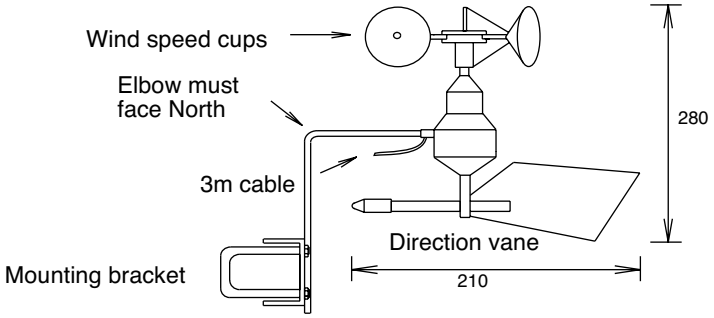
A mounting bracket is provided suitable for mounting onto a horizontal/vertical pole - Max pole diameter 50mm. Flammability - Anodised aluminium assembly with plastic cups and vane.

Type	Application	Range	Output	Switch1 Rating	Max Current	Start Speed	Accuracy	Protection
EWS-4	Wind Speed	0-90m/s	switch contact 1 pulse/1.493m	0-100 VDC Max 0-50W DC resistive	0.5A 0-24VDC	0.5m/s from zero wind speed	2%	IP65
EWSD-2	Wind Speed & Direction	0-90m/s 0-360°	switch contact 1 pulse/1.493m	0-100 VDC Max 0-50W DC resistive 0-1 kΩ pot 0-357° endless travel	0.5A 0-24VDC	0.5m/s from zero wind speed 3° headband at North	2%	IP65

SPECIAL ORDER ONLY

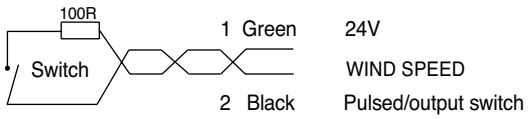
Speed measurement - magnetic reed switch producing one contact closure per rotation, which is equivalent to 1.493m travel.
Counting this over a time period produces a rate in m/s.
10000 revolutions per hour = 14930 metres per hour = 14.93 Km/h = 4.148 m/s m/s x 3.6 = km/h.

DIMENSIONS

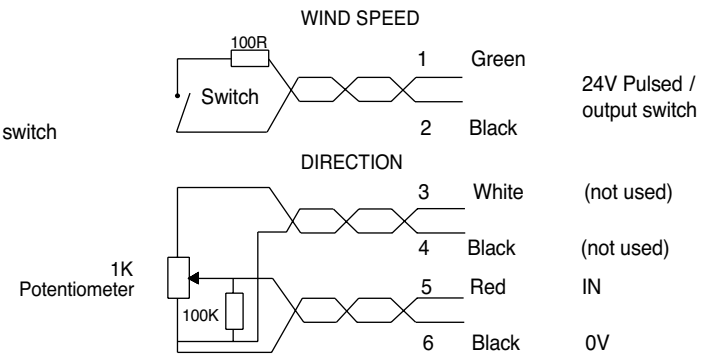


WIRING:

EWS-4



EWSD-2



The 3m cable can be extended using screened 7/0.2mm wire equivalent to Belden 9503. The screen is not connected in the sensor and should be earthed at the controller end. Keep away from power cables/units which may cause interference.

INSTALLATION: The unit should be mounted on a pole at a height of about 2m.
Situate the unit in a clear site which is most representative of the area to be monitored.
Avoid extremes ie hilltops which may indicate increased wind speeds, or valleys and in close proximity to trees and buildings which may indicate decreased wind speeds due to shielding.
Several sensor heads can be installed to give spatial coverage and thus achieving more precise results.
Ensure the elbow points NORTH using a compass or gently rotate the vane until 0 or 357 is indicated on a suitable measuring instrument, as this will represent North. Fix and tighten the bracket at this position.

WIND SPEED / DIRECTION LEVEL

WIND SPEED & DIRECTION SENSOR 0-10 VDC

EWSD-10

- This product is suitable for measuring wind speed, wind direction or both. It can be used for automatic window closure in high wind conditions or general monitoring applications with BMS systems.

  The 0-10vdc output signal is linear for both wind speed & direction.

Max Ambient -20/+70°C

A bracket is provided suitable for mounting onto a mast of diameter between 30 - 50mm.

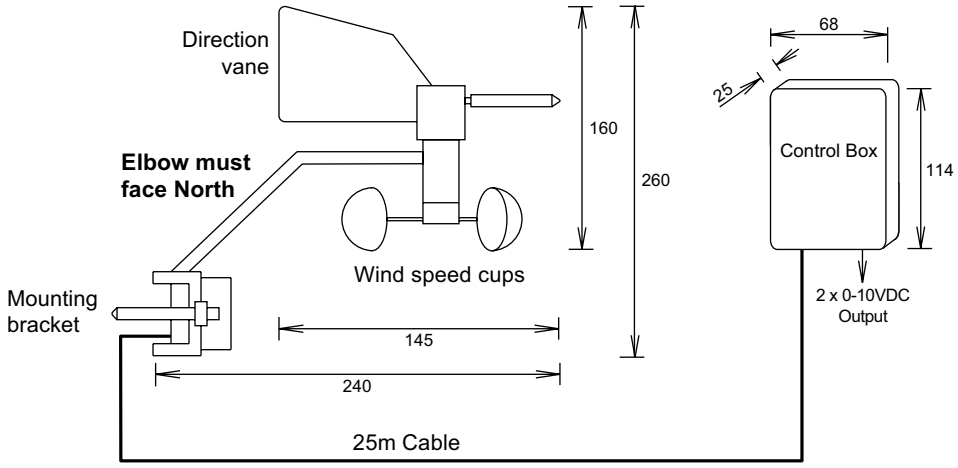
Flammability: Anodised aluminium alloy UPVC & Stainless Steel assembly with polypropylene cups.

Electrical connection 25m 4-core screened cable supplied as standard. This can be extended up to 200m Max. Consumption 40mA Max.

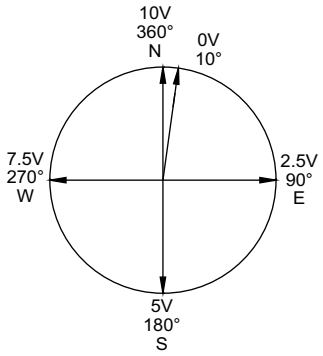
Type	Application	Supply ±15%	Range	Output 2 x 0-10VDC	Start Speed Approx.	Typical Accuracy	Resolution	Protection
EWSD-10	Wind Speed	24VAC/DC	0 - 50 m/s	0 - 10VDC	<0.5 m/s	±5% or 1.5 m/s	< 0.5 m/s	IP65 Sensor
	Direction		0 - 360°	0V = 10° 5V = 180° (South) 10V = 360° (North)	<0.5 m/s	5° typical (10° worst)	< 1°	IP30 Control Box

Speed measurement - Hall Effect solid state magnetic switch activated by magnets in the cup rotor.

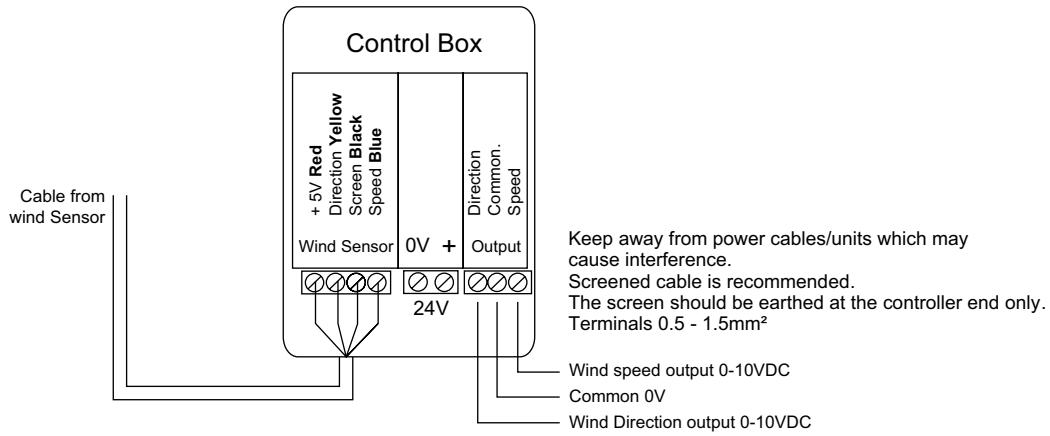
DIMENSIONS



EXAMPLE: WIND DIRECTION



WIRING:



Supplied with the control box which converts the sensor signal to a standard 0-10 volt output signal.

INSTALLATION: The unit should mounted to a mast with a diameter of between 30-50 mm with the supplied V-shaped clamp and bracket.
Situate the unit in a clear site which is most representative of the area to be monitored.
Avoid extremes ie hilltops which may indicate increased wind speeds, or valleys and in close proximity to trees and buildings which may indicate decreased wind speeds due to shielding.
Several sensor heads can be installed to give spatial coverage and thus achieving more precise results.
Ensure the elbow points NORTH using a compass or gently rotate the vane until 0° or 357° is indicated on a suitable measuring instrument, as this will represent North. Fix and tighten the bracket at this position.

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AIR VELOCITY / AVERAGING PITOT TUBES

EVP..

These units consist of tubes with holes along the length which can be used to sense the average air velocity across air ducts. Suitable for use with our EDT.. Air Differential Pressure Transmitters.

INSTALLATION:

For smaller ducts the tubes can be cut to length. The end plugs must then be refitted.
Mount away from bends, elbows and turbulent areas.
Each flange has a neoprene gasket.

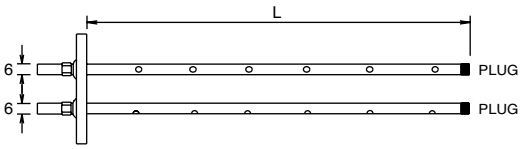
EVP-300 / EVP-500 - These units can be installed from outside the duct and the tubes are self-supporting.

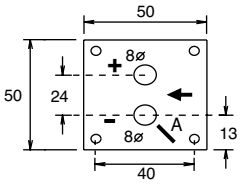
Type	Length between flange(s) mm	Mounting	Pressure Connection	Tube Material
EVP-300	300	1 Flange	Brass 6mm Push-on	Brass 6mm OD
EVP-500	500	1 Flange	Brass 6mm Push-on	Brass 6mm OD

Longer lengths are avaiable to special order.

DIMENSIONS

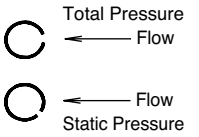
EVP..





\+ Senses total pressure. Holes must face air flow directly

\- Senses static pressure. Rotate tube up or down towards position 'A' approx angle 36-42° to obtain correct Velocity Pressure for the required Air Velocity.
Velocity Pressure = Total Pressure − Static Pressure



Ensure that the arrow on the flange plate points in the direction of air flow.

CALCULATIONS:

To calculate the Air Velocity, use table below or the following equation:

$$\text{Air Velocity} = \sqrt{\frac{2 \times \text{Velocity Pressure}}{1.2}}$$

Example: Velocity Pressure is 62.42 Pa
This equates to **10.2m/s** Air Velocity *

When velocity pressure is established, the ADP Transmitter can be selected, ie with a range of 0 - 100 Pa.

TABLE OF VELOCITY PRESSURE IN PASCALS AGAINST VELOCITY IN METRES PER SECOND

m/s	0	0.1	**0.2** *	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0	0.00	0.01	0.02	0.05	0.10	0.15	0.22	0.29	0.38	0.49
1	0.60	0.73	0.86	1.01	1.18	1.35	1.54	1.73	1.94	2.17
2	2.40	2.65	2.90	3.17	3.46	3.75	4.06	4.37	4.70	5.05
3	5.40	5.77	6.14	6.53	6.94	7.35	7.78	8.21	8.66	9.13
4	9.60	10.09	10.58	11.09	11.62	12.15	12.70	13.25	13.82	14.41
5	15.00	15.61	16.22	16.85	17.50	18.15	18.82	19.49	20.18	20.89
6	21.60	22.33	23.06	23.81	24.58	25.35	26.14	26.93	27.74	28.57
7	29.40	30.25	31.10	31.97	32.86	33.75	34.66	35.57	36.50	37.45
8	38.40	39.37	40.34	41.33	42.34	43.35	44.38	45.41	46.46	47.53
9	48.60	49.69	50.78	51.89	53.02	54.15	55.30	56.45	57.62	58.81
10 *	60.00	61.21	**62.42** *	63.65	64.90	66.15	67.42	68.69	69.98	71.29
11	72.60	73.93	75.26	76.61	77.98	79.35	80.74	82.13	83.54	84.97
12	86.40	87.85	89.30	90.77	92.26	93.75	95.26	96.77	98.30	99.85
13	101.40	102.97	104.54	106.13	107.74	109.35	110.98	112.61	114.26	115.93
14	117.60	119.29	120.98	122.69	124.42	126.15	127.90	129.65	131.42	133.21
15	135.00	136.81	138.62	140.45	142.30	144.15	146.02	147.89	149.78	151.69
16	153.60	155.53	157.46	159.41	161.38	163.35	165.34	167.33	169.34	171.37
17	173.40	175.45	177.50	179.57	181.66	183.75	185.86	187.97	190.10	192.25
18	194.40	196.57	198.74	200.93	203.14	205.35	207.58	209.81	212.06	214.33
19	216.60	218.89	221.18	223.49	225.82	228.15	230.50	232.85	235.22	237.61
20	240.00	242.41	244.82	247.25	249.70	252.15	254.62	257.09	259.58	262.09
21	264.60	267.13	269.66	272.21	274.78	277.35	279.94	282.53	285.14	287.77
22	290.40	293.05	295.70	298.37	301.06	303.75	306.46	309.17	311.90	314.65
23	317.40	320.17	322.94	325.73	328.54	331.35	334.18	337.01	339.86	342.73
24	345.60	348.49	351.38	354.29	357.22	360.15	363.10	366.05	369.02	372.01
25	375.00	378.01	381.02	384.05	387.10	390.15	393.22	396.29	399.38	402.49
26	405.60	408.73	411.86	415.01	418.18	421.35	424.54	427.73	430.94	434.17
27	437.40	440.65	443.90	447.17	450.46	453.75	457.06	460.37	463.70	467.05
28	470.40	473.77	477.14	480.53	483.94	487.35	490.78	494.21	497.66	501.13
29	504.60	508.09	511.58	515.09	518.62	522.15	525.70	529.25	532.82	536.41
30	540.00	543.61	547.22	550.85	554.50	558.15	561.82	565.49	569.18	572.89

AIR VELOCOTY

AIR VELOCITY TRANSMITTER 0-10VDC

EAV..

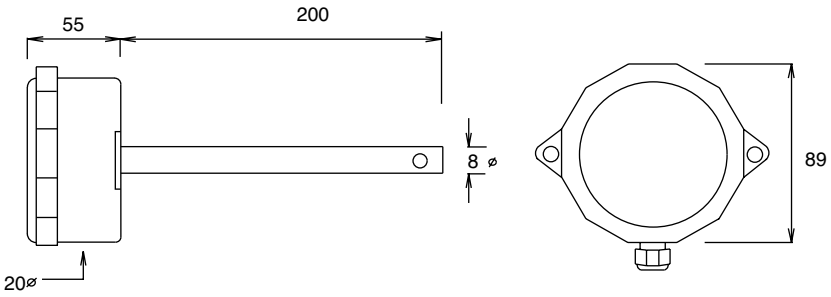
To measure the air velocity in HVAC ducts and provide a linear 0-10vdc output signal across the range. The unit operates on a thermal principle based on the cooling effect from the air speed.

Accuracy ±1% at mid range at 20°C
Response time < 2s
Media Temp -10/+60°C
Media Humidity 0/80%RH
Max Ambient -20/+60°C
Allow 15s for the unit to stabilise when it is first switched on.
Consumption 85mA
Enclosure Flammability = UL94-V0

Type	Mounting	Range m/s	Supply ±15%	Output Signal	Load	Enclosure
EAV-4	Duct	0/4	24VAC/DC	0-10vdc	>10KΩ	IP65
EAV-8	Duct	0/8	24VAC/DC	0-10vdc	>10KΩ	IP65
EAV-16	Duct	0/16	24VAC/DC	0-10vdc	>10KΩ	IP65

DIMENSIONS

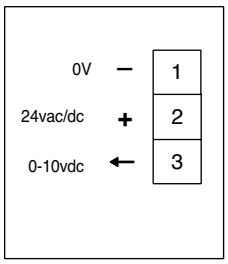
EAV..



Ensure that the air flows directly through the holes in the side of the probe. The air can enter the holes from either side.
Mount away from bends, elbows and turbulent areas. Avid installi.ng in areas where the temperature in the duct changes rapidly.
DO NOT SUBJECT THE SENSING ELEMENT TO OILY, DIRTY, DUSTY OR MOIST MEDIA.

WIRING:

EAV..



INSTALLATION: Terminals 0.5-2.5mm Min sensor / control signal cable size 7/0.2mm Max length 100m.

Screened cable is recommended. The screen should be earthed at controller end only.

Keep sensor/control signal wires away from power cables/units which may cause interference.

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CURRENT SWITCHES FIXED SWITCH POINT

ESOL.. ESLT....

These units are powered by induction from the monitored AC conductor which passes through the hole/core. They sense current flow and can monitor the operation/failure of fans, pumps, motors etc. Simply connect 2 wires to indicate run /fail - the normally open switch contacts close when the setpoint is exceeded. The GNG models incorporate dry contacts for true digital switching.


ESOL.


ESLT..

Hysteresis: <2% Full Scale max

Enclosure Flammability: UL94-V0

Input Frequency Range: 50/60 Hz

Operating Temperature: 15 to 60°C

RH: 5 - 90%

Response Time: <200mS

Type	Description	Switch Rating Max	On State Volt Drop @ 24vdc @150mA	Leakage Current	Set Point	Conductor Current Input Range
ESOL-GNG-200	Solid Core	30VAC/VDC 0.5A	<0.1V	<25µA	0.75A Fixed	0.5 - 200A
ESLT-GNG-200	Split Core	30VAC/VDC 0.5A	<0.1V	<25µA	2.0A Fixed	2.0 - 200A

On State Volt Drop - amount of voltage which drops through the switch contacts when they are closed.
Leakage Current - amount of current leaked across the switch contacts when they are open.
Both factors are very small and generally insignificant for most applications.

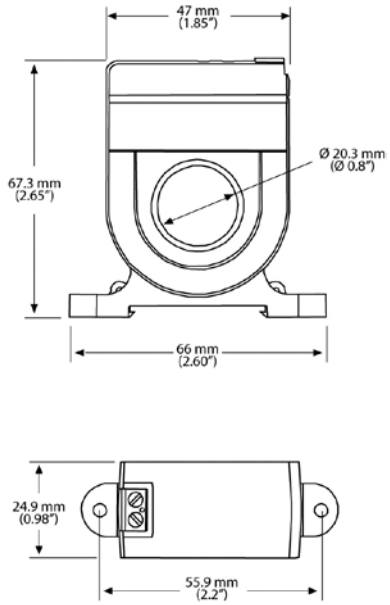
If the conductor current is too low ie 0.5A, it can be looped through the current switch more than once ie 3 loops = 1.5A, this also divides the maximum range by 3.
If the conductor wire is too large, or the current too high it can be wired to the primary side of a current transformer, the secondary side then passes through the current switch hole/core.

Easy to use switches, for flow/no flow applications with dry contacts for true digital switching.

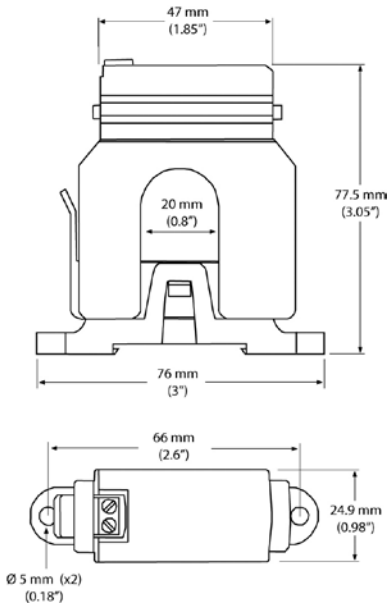
Do NOT exceed the voltage or current ratings as this will cause damage to the device.
Normally Open switch contacts close when the current flow exceeds the set point.

DIMENSIONS

ESOL-GNG-200



ESLT-GNG-200



INSTALLATION: Ensure core is clean at time of installation as dirt/foreign particles may prevent correct operation.
The split core device can be opened by using a large blade screwdriver positioned in the centre of the latch.
When closing the split core ensure that the two halves are properly aligned. Pass the live conductor/wire through the core.

The solid state switch contacts can only be checked for operation when the switch circuit power is applied.

Under current indication : Belt, fan or pump failure : For normal running the current should be above the set point & the switch contact closed. If the belt is broken, fan or pump stopped or the electrical supply fails the switch contact will open.

Over current indication : Locked rotor. For normal running the current should be below the setpoint and the switch contact should be open. When current exceeds the set point the switch contact closes providing indication of current flows above the normal full load amps.

CURRENT SWITCHES / SENSORS

CURRENT SWITCHES ADJUSTABLE SET POINT

ESOL.. ESLT..

These devices are powered by induction from the monitored AC conductor which passes through the hole/core. They sense the current flow and can thereby monitor the operation/failure of fans, pumps, motors, etc.

The Normally Open triac switch closes when the current flow exceeds the set point. The switch point is adjustable via a multi turn pot.

ESOL-325NS


ESLT-325NSC

Hysteresis: <2% Full scale max

Enclosure Flammability: UL94-V0

Operating Temperature: 0 to 70°C

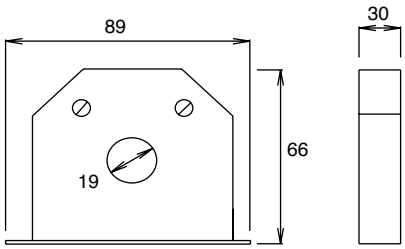
Response Time: <200mS

Type	Description	Switch Rating Max		Input Frequency Range	Leakage Current	Set Point	Conductor Current Input Range
ESOL-325NS	Solid Core	250VAC	1A	10 - 400Hz	<1mA	Adj	1.25-6, 6-40, 40-200A
ESLT-325NSC	Split Core	250VAC	1A	10 - 400Hz	<1mA		1.5-200A

On State Volt Drop - amount of voltage which drops through the switch contacts when they are closed.
Leakage Current - current leaked aross the switch contacts when they are open.
Both factors are very small and generally insignificant for most applications.

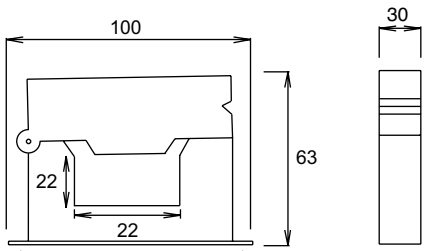
DIMENSIONS

ESOL-325NS



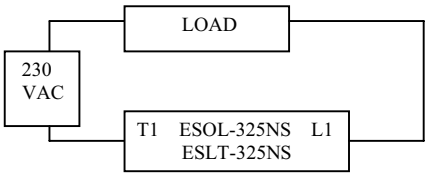
Mounting holes
2 x 5dia on 76 centres

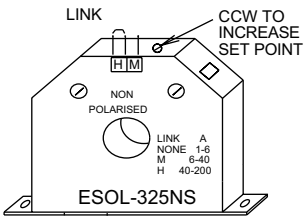
ESLT-325NSC

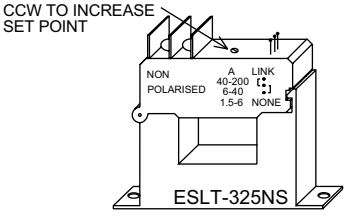


Mounting holes
2 x 5dia on 88 centres

WIRING:







INSTALLATION: Ensure core is clean as dirt/foreign particles may prevent correct operation. If the conductor current is too low ie 0.5A, loop through the sensor more than once, ie 3 loops = 1.5A, this also divides the maximum range by 3. If the conductor wire is too large, or the current too high it can be wired to the primary side of a current transformer, the secondary side then passes through the hole/core.

Do NOT exceed the voltage or current ratings as this will cause damage to the device. Pass only the live conductor/wire through the core. Ensure link/jumper is in the correct position before switching the power on. The switch contacts are non-polarised.

The solid state switch contacts can only be checked for operation when the switch circuit power is applied.

Under current indication : Belt, fan or pump failure : For normal running the current should be above the set point & the switch contact closed. If the belt is broken, fan or pump stopped or the electrical supply fails the switch contact will open.

Over current indication : Locked rotor. For normal running the current should be below the setpoint and the switch contact should be open. When current exceeds the set point the switch contact closes providing indication of current flows above the normal full load amps.

SET POINT ADJUSTMENT: Factory set to minimum (adjustment fully clockwise) To increase set point, turn monitored load on, (the NO contacts will close) turn the adjustment counter-clockwise until the switch contacts open as indicated by the status LED or a voltmeter connected to the switch. Then turn adjustment clockwise until the LED comes back on or voltmeter is seen indicating contacts closed. LED is not fitted on all types. The adjustment should then be turned slightly clockwise past this point to ensure current fluctuations do not cause false conditions.

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CURRENT SENSORS 0-10VDC / 4-20MA

ESOL.. ESLT..

These devices are powered by induction from the monitored AC conductor which passes through the hole/core. A 0-10vdc or 4-20mA output signal linear across the range is produced. They sense the current flow and can thereby monitor the operation/failure of fans, pumps, motors etc.

Enclosure Flammability: UL94-V0

Response Time 500ms

Operating Temperature: -15 to 50°C

Operating Humidity: 0 to 95% non cond.

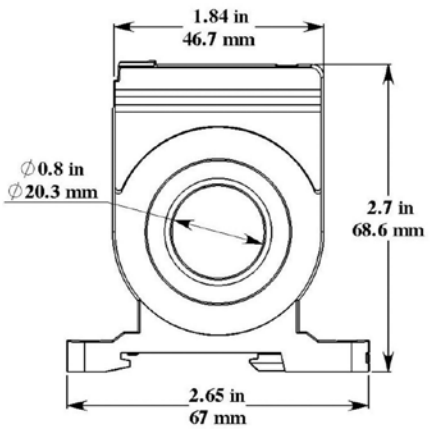
Can be DIN rail mounted

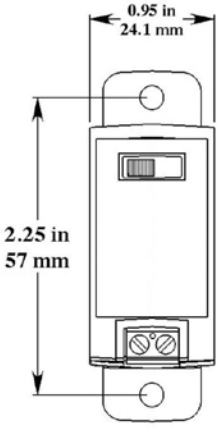
Type	Description	Output	Powered by	Accuracy	Frequency	Input range (selectable)	Max overload current
ESOL-651-R1	Solid core	0-10VDC	self powered	+/-2%FS	50/60Hz	0-10A,20A,50A	100A
ESOL-651-200	Solid core	0-10VDC	self powered	+/-2%FS	50/60Hz	0-200 (fixed range)	225A
ESOL-675-R1	Solid core	4-20mA	24VDC loop	+/-2%FS	20/400Hz	0-10A,20A,50A	3 x Range
ESOL-675-R2	Solid core	4-20mA	24VDC loop	+/-2%FS	20/400Hz	0-50A,100A,150A	2 x Range
ESLT-651-R1	Split core	0-10VDC	self powered	+/-2%FS	50/60Hz	0-20A,40A,60A	100A
ESLT-651-R2	Split core	0-10VDC	self powered	+/-2%FS	50/60Hz	0-50A,100A,150A	150A
ESLT-675-R1	Split core	4-20mA	24VDC loop	+/-2%FS	20/400Hz	0-10A,20A or 50A	3 x Range
ESLT-675-R2	Split core	4-20mA	24VDC loop	+/-2%FS	20/400Hz	0-50A,100A,150A	2 x Range

Select the range according to the conductor current.
If the conductor current is too low ie. 0.5A then loop through the sensor more than once ie. 3 loops = 1.5A and will divide the maximum range by 3.
If the conductor wire is too large, or the current too high it can be wired to the primary side of a current transformer, the secondary side wire is then passed through the sensor core. Do NOT exceed the voltage or current ratings as this will cause damage to the device.

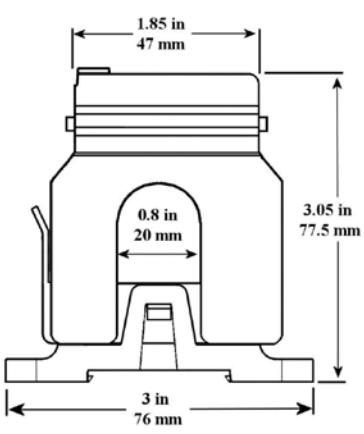
DIMENSIONS

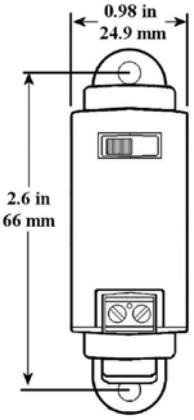
ESOL..





ESLT..





WIRING: Set the switch to the required range

INSTALLATION:

Ensure the core is clean at the time of installation as dirt/foreign particles may prevent correct operation.
Ensure ink/jumper is in the correct position before switching the power on. Pass the live conductor/wire through the core.

OUTPUT 0-10VDC : If the range is 0-10 amps the output will be 0-10vdc linear over 0-10 amps.

OUTPUT 4-20mA: If the range is 0-10 amps the output will be 4-20mA linear over 0-10 amps.

Min cable size 7/0.2mm Max cable length 100m. Keep away from power cables/units which may cause interference.
Screened cable is highly recommended. The screen should be earthed at controller end only.

AIR FLOW SWITCHES

EAA..

EAA.. detects air flow in ducts to monitor fan operation and switches in the event of flow failure. It is suitable for non-aggressive and non-combustible clean air/gases.

Concealed adjustment

Volt free contacts

Max. ambient 70°C

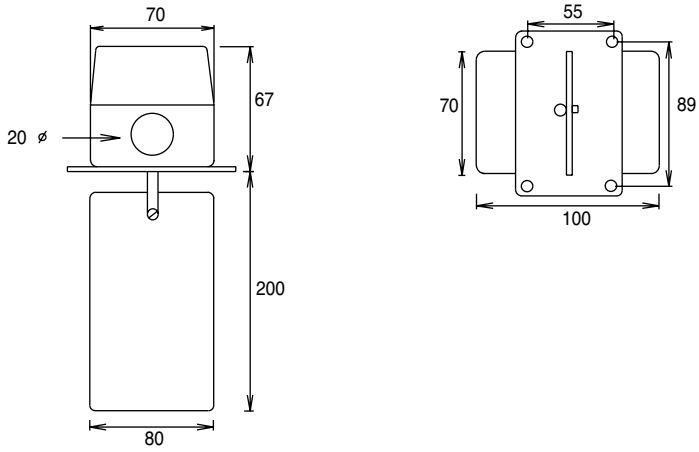
Enclosure Flammability = UL94-V0

Media Contact Parts: Mounting bracket steel zinc plated, Stainless steel paddle, Brass rod, Plastic enclosure.

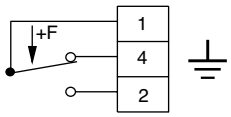
Flow rates are approximate, taken with the switch mounted in a horizontal duct.

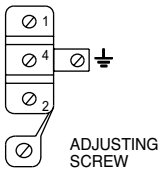
Type	Min. Adjustment		Max. Adjustment		Max Velocity	Max Media Temp°C	230VAC SPDT	Enclosure
	Cut-in	Cut-out	Cut-in	Cut-out				
EAA-1	2 m/s	1 m/s	9 m/s	8 m/s	15m/s	80	15(8)A	IP54
EAA-1W	2 m/s	1 m/s	9 m/s	8 m/s	15m/s	80	15(8)A	IP65

DIMENSIONS



WIRING:

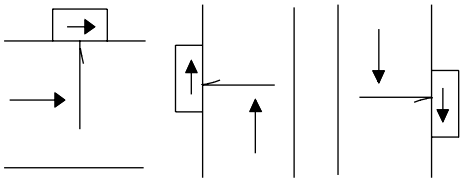




Flow 1-2 close 1-4 open. No flow 1-4 close 1-2 open.
When the flow is above the cut-in setting 1-2 close. When flow decreases (cut-out) 1-4 close.

Adjustment : Units are pre-set to the approx minimum setting.
Adjusting below this value may result in the switch failing to return.
The switch point is increased by turning the adjusting screw clockwise.

INSTALLATION:



Before installing push the paddle slowly, allow it to return slowly, the switch should operate.
Ensure the arrow on the housing points in the direction of the flow.
Mount away from elbows, bends and other restrictions likely to cause turbulence.
Upstream & downstream of the switch should be straight for at least five times duct diameter.
Do not mount on the side of a horizontal duct as the paddle weight will affect the switching.
The paddle must not touch the duct or be obstructed in any way.
The paddle may be trimmed to increase the switching value.
When the unit is installed in a vertical duct with downward airflow it is necessary to trim the paddle slightly to compensate for the weight.

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LIQUID FLOW SWITCHES 15MM/22MM COMPRESSION

ELF..

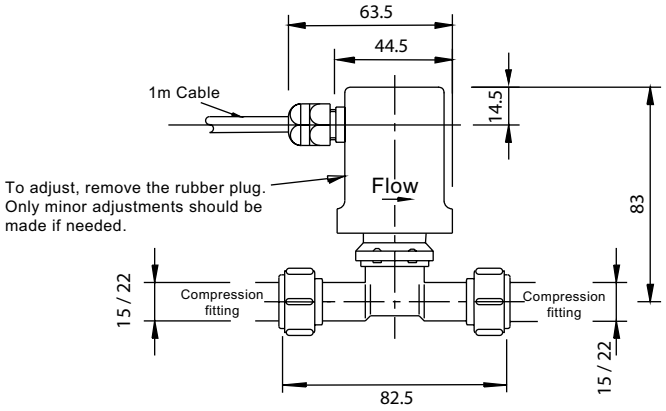
The ELF-15C & ELF-22C liquid flow switches are suitable for use in detecting flow in a wide range of applications ie. hot water, chilled water, drinking water, diesel oil and up to 30% glycol systems. They are normally used to monitor pump operation or switch alarms in the event of flow failure.

- Concealed adjustment
- Volt free contacts
- Max. ambient 70°C
- Max Media Pressure 8 bar
- Enclosure Flammability = UL94-V0
- Fluids must not contain dissolved or undissolved particles

Type	Suitable for pipe dia.	230VAC SPDT	Switch Point Adjustable	Media Contact Material	Connection	Media Temp °C	Enclosure
ELF-15C	15mm	15(3)A	1.5 - 3 l/min	Brass, Polypropylene	15mm Compression	+4/85	IP65
ELF-22C	22mm	15(3)A	1.5 - 3 l/min	Brass, Polypropylene	22mm Compression	+4/85	IP65

DIMENSIONS

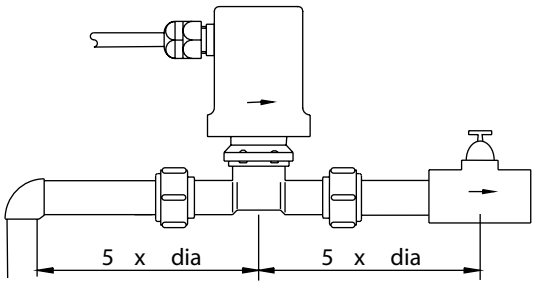
ELF..



WIRING:

Brown Wire	Common
Black Wire	NO Normally Open
Grey Wire	NC Normally Closed
Flow :	C-NO close C-NC open
No Flow :	C-NC close C-NO open

INSTALLATION:



1 Ensure the arrow on the housing points in the direction of flow.

2 Mount at any angle from vertical to 30 degrees above the horizontal. Other positions are not recommended as particles may fall into the unit and obstruct the rod from moving freely. It is recommended that a filter is installed upstream of the unit to protect against foreign particles.

3 Mount away from elbows, bends and other restrictions likely to cause turbulence.

4 Upstream-downstream of the switch should be straight for at least 5 x pipe diameter.

Ensure that the pipes / tubes are not pushed too far into the flow switch connections as this can restrict the paddle from moving freely and affecting the correct switching operation.

If adjustment is required, do not over-adjust as this may result in the switch failing to return.

Before installing, push the paddle and allow it to return slowly, the switch should operate.

LIQUID FLOW SWITCHES

ELF..

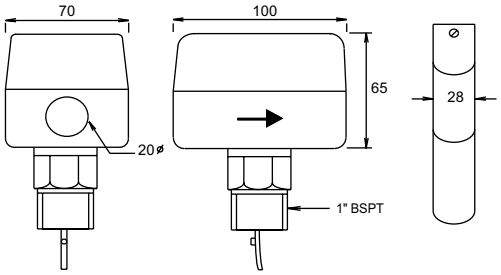
ELF.. detects liquid flow through chillers, boilers, pipes and other units to monitor pump operation or switch alarms in the event of flow failure ie. hot water, chilled water, diesel oil and up to 30% glycol systems. ELF-4../5.. can be used with some aggressive liquids. Not suitable for salt water.

Concealed adjustment
Volt free contacts
Max. ambient 70°C
Max Media Pressure 12 bar
1" 2" 3" paddles included.
Paddles can be cut to suit pipe diameter.
Enclosure Flammability = UL94-V0
ELF-15C / ELF-22C with 15/22mm compression fittings see seperate data sheet.
1m³/h = 0.27 l/sec

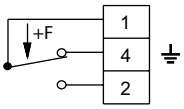
Type	Media Temp°C	230VAC SPDT	Operation	Media Contact Materials	Connection	Suitable for pipe dia.	Enclosure
ELF-1C	+4/110	15(8)A	Normal	Phosphor Bronze/Stainless steel/Brass	1" BSPT	1" - 8"	IP54
ELF-3	+4/110	15(8)A	Sensitive	Phosphor Bronze/Stainless steel/Brass	1" BSPT	1" - 8"	IP54
ELF-4	+4/110	15(8)A	Aggressive	Stainless steel	1" BSPT	1" - 8"	IP54
ELF-5	+4/110	15(8)A	Sensitive	Stainless steel	1" BSPT	1" - 8"	IP54
ELF-3W	-30/+110	15(8)A	Sensitive	Phosphor Bronze/Stainless steel/Brass	1" BSPT	1" - 8"	IP65
ELF-4W	-30/+110	15(8)A	Aggressive	Stainless steel	1" BSPT	1" - 8"	IP65
ELF-5W	-30/+110	15(8)A	Sensitive	Stainless steel	1" BSPT	1" - 8"	IP65
ELF-7	+4/110	15(8)A	Normal	Phosphor Bronze/Stainless steel/Brass	Tee ¾ " x ¾"x 1"	¾" Only	IP54

DIMENSIONS

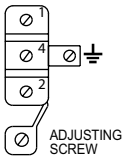
ELF..



WIRING:



Flow: 1-2 close 1-4 open.
No Flow: 1-4 close 1-2 open.



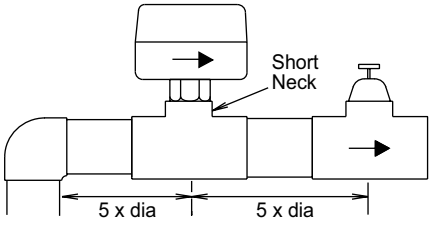
Adjustment : Units are pre-set to the approx. minimum setting. Adjusting below this value may result in the switch failing to return To increase switch point, slowly turn adjusting screw CLOCKWISE

ACCESSORIES:

EE-PS Set of 1, 2 & 3" paddles for ELF..

EE-6P 6" Paddle for ELF-1,2,3,4,5

INSTALLATION:



1 Before installing, push paddle & allow it to return slowly, the switch should operate.
2 Ensure the arrow on the housing points in the direction of flow.
3 Mount at any angle from vertical to horizontal. Other positions are not recommended as particles may fall into the unit and obstruct the rod from moving freely.
4 Mount away from elbows, bends and other restrictions likely to cause turbulence.
5 Upstream-downstream of the switch should be straight for at least 5 x pipe diameter.
6 Use a short neck weld socket or short branch tee, DO NOT mount in a long branch.
7 The paddle must not touch the pipe or be obstructed in any way.
8 Remove/trim paddles to suit pipe diameter.
9 EE-6P can be fitted over existing paddles for extra strength in larger pipes.

FLOW RATES:

All Flow rates indicated below are approximate and the readings have been taken with the unit mounted in a horizontal pipe.
A slightly higher flow rate may be required if the unit is mounted in another position to compensate for the weight of the paddle.
Example : ELF-1 pipe dia 2" On min adj. switch makes when flow increases to 3.1 m³/h and breaks when flow decreases to 2.2 m³/h.

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LIQUID LEVEL SWITCHES HORIZONTAL

ELL.. EL..

To monitor liquid level in tanks and switch pumps or an alarm in the event of high or low level. Two switches are required when using both high and low level or limit and alarm functions. EL-041 / 093 switches contain magnets, therefore ensure that no metal objects are present in the liquid.

Volt free contacts

Max. ambient 70°C

Liquid sp. gravity > 0.75

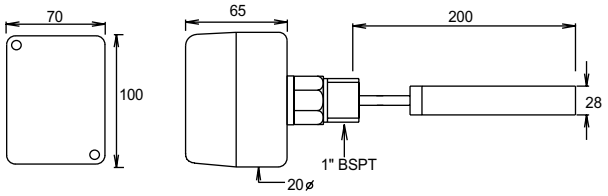
Enclosure Flammability:
ELL.. = UL94-V0
EL.. = Metal

Media :
ELL.. Oil, Diesel, Water, Non aggressive fluids
EL-041/ 093 Oil, Diesel, Water, Some aggressive fluids

Type	Mounting Cut-in	Diff. mm	Max. Media Temp °C	Max. Media Press. Bar	230VAC SPDT	Media Contact Materials	Enclosure
ELL-01	Horizontal	12	90	4	15(8)A	Brass/Phosphor Bronze/Polypropylene	IP54
ELL-02	Horizontal	12	90	4	15(8)A	Brass/Phosphor Bronze/Polypropylene	IP65
EL-041	Horizontal	12	330	25	10(5)A	Stainless steel	IP65
EL-093	Horizontal	125/550 adj.	330	25	10(5)A	Stainless steel	IP65

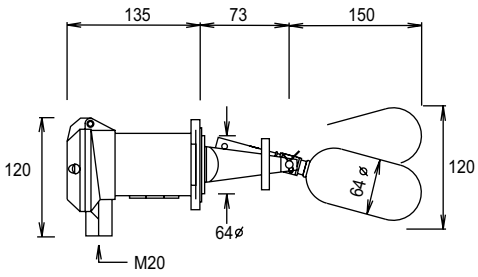
DIMENSIONS

ELL-01 / 02

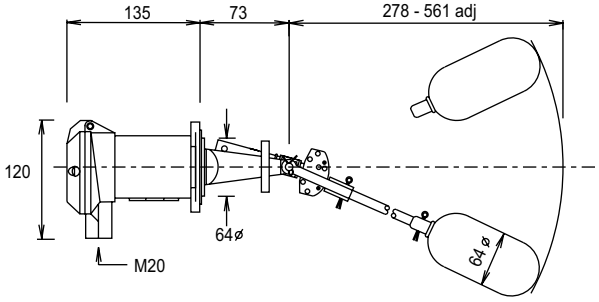


NOTE:
LEVEL SWITCHES MUST BE MOUNTED HORIZONTALLY WITH THE ELECTRICAL ENTRY FACING DOWNWARDS.

EL-041

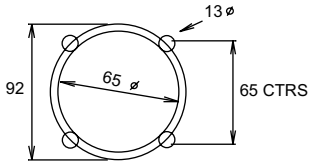


EL-093



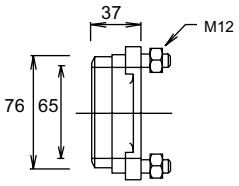
DRILLING DETAIL:

EL-041 DIRECT MOUNTING



Use M12 studs to project 30mm

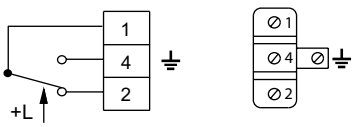
EL-MF.. WELDED MATING FLANGE



ACCESSORIES: WELDED MATING FLANGE for EL-041, 093 **EL-MF** Carbon Steel **EL-MF/ST** Stainless Steel

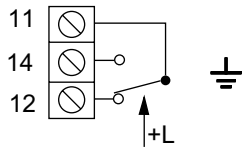
WIRING:

ELL..



On level rise contacts 1-4 close 1-2 open.
On level fall contacts 1-2 close 1-4 open.

EL..



On level rise contacts 11-14 close 11-12 open.
On level fall contacts 11-12 close 11-14 open.

LEVELS

LIQUID LEVEL SWITCHES HIGH - LOW SWITCHING

EL..

These level switches are suitable for mounting from the top of a tank to monitor the level of liquid. The float follows the surface of the liquid level. The switches within the float operate according to the tilting action.

Polypropylene float - PVC cable
Volt free contacts
Liquid sp. gravity > 0.7
Enclosure Flammability = UL94-HB
Media : Water, non-combustible and non-aggressive fluids.
Max pressure 2 bar

Type	Mounting	Difference mm Approximatly	Media Temp °C	PVC Cable Length	Switch Rating	Function	Switch Operation
EL-AL	Vertical	40	0-55	5m	230VAC 6(3)A	Low level alarm	Close on low level & Open on rise
EL-AH	Vertical	40	0-55	5m	230VAC 6(3)A	High level alarm	Close on high level & Open on fall
EL-AHL	Vertical	250/1200 adj. Dead band	0-55	5m	230VAC 6(3)A	Hi & Lo level alarm	Close on high – Off – Close on low
EL-PF	Vertical	250/1200 adj.	0-55	5m	230VAC 6(3)A	Pump filling	Close on low level until high level
EL-PE	Vertical	250/1200 adj.	0-55	5m	230VAC 6(3)A	Pump emptying	Close on high level until low level

DIMENSIONS

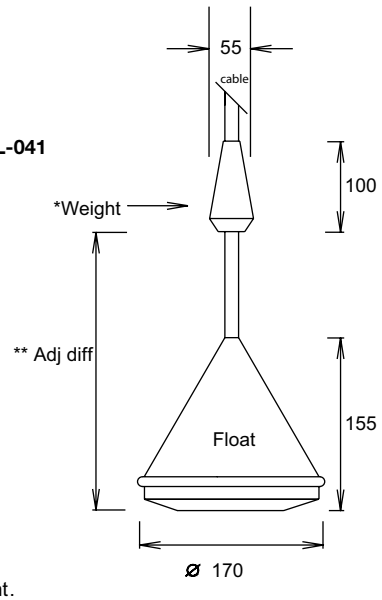
EL..

Fix the bracket to the wall/tank, leaving the float to hang on the cable.

Bracket

Adjust cable length according to the switching level required.

EL-041

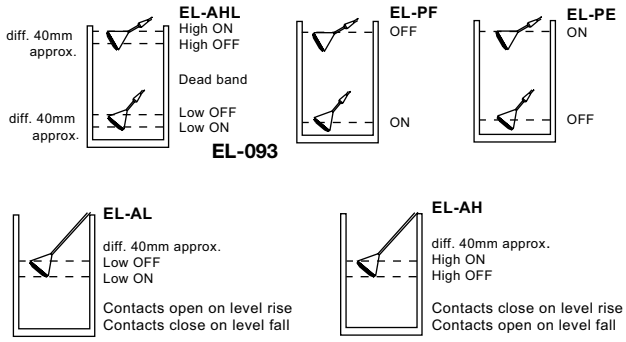


cable

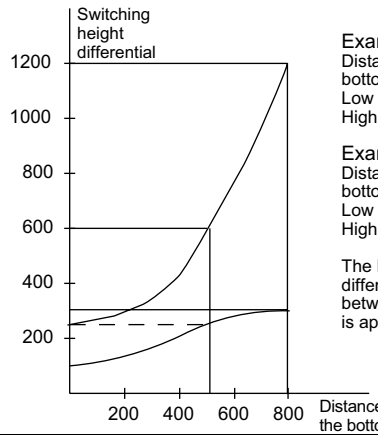
A fixing bracket to secure the cable at the top of the tank is included.

*EL-AL & EL-AH do not use a weight. The switching point can be set by adjusting the length of cable in the tank.

**On other types the switching differential is at minimum when the weight is nearest to the float.



EL-AHL, EL-PF & EL-PE
Adjustable Weight-Switching Differential



Example 1
Distance of weight from the bottom of the float 500mm :
Low switching 250mm Approx.
High switching 600mm Approx.

Example 2
Distance of weight from the bottom of the float 800mm :
Low switching 300mm Approx.
High switching 1200mm Approx.

The Maximum switching differential which can be set between high and low switching is approximatly 900mm.

WIRING:

EL-AL	1-2 close on low level. When the level increases by about 40mm (diff) the contact opens.
EL-AH	1-2 close on high level. When the level decreases by about 40mm (diff) the contact opens.
EL-AHL	1-2 close on high level. When the level decreases by about 40mm (diff) the contact opens. 1-3 close on low level. When the level increases by about 40mm (diff) the contact opens.
EL-PF	1-2 close on low level until high level
EL-PE	1-2 close on high level until low level

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LIQUID LEVEL SWITCHES VERTICAL

EL-140 / 141, ETF-1

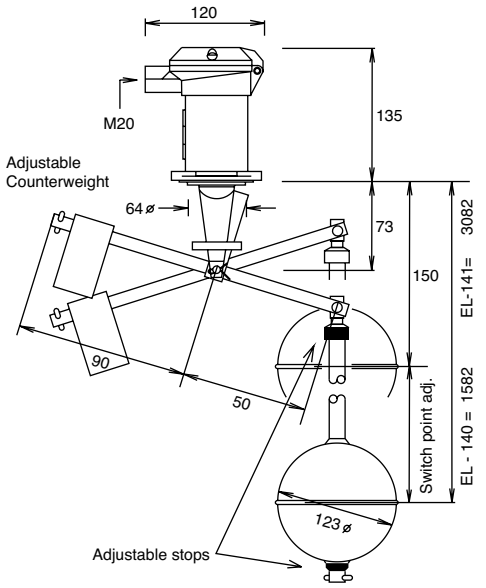
To monitor liquid level in tanks and switch pumps or an alarm in the event of high or low level. Two switches are required when using both high and low level or limit and alarm functions. EL-140 / 141 switches contain magnets, therefore ensure that no metal objects are present in the liquid.

Volt free contacts
Max. ambient 70°C
Liquid sp. gravity > 0.75
Enclosure Flammability:
EL.. = Metal ETF.. = UL94-HB
Media :
ETF.. Oil, Diesel, Water, Non-aggressive fluids
EL-140 / 141 Oil, Diesel, Water, Some aggressive fluids

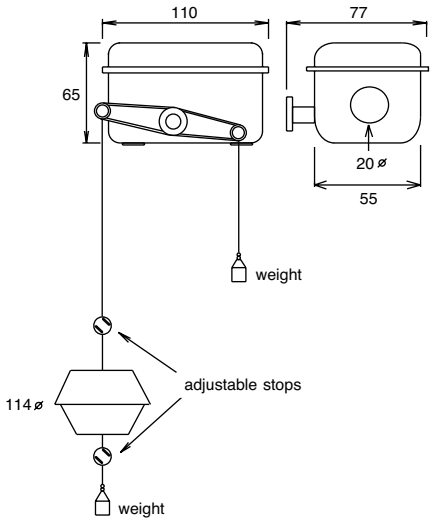
Type	Mounting Cut-in	Diff. mm	Max. Media Temp °C	Max. Media Press. Bar	230VAC SPDT	Media Contact Materials	Enclosure	
EL-140	Vertical	30/1340 adj.	330	25	10(5)A	Stainless steel	IP65	SPECIAL ORDER ONLY
EL-141	Vertical	30/2340 adj.	330	25	10(5)A	Stainless steel	IP65	
ETF-1	Vertical	30/900 adj.	65	5	10(5)A	Nylon/Plastic	IP54	

DIMENSIONS

EL-140 / 141



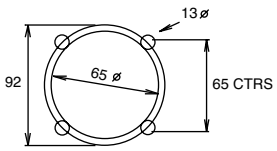
ETF-1



When float reaches upper adj stop C-NC close : When float reaches lower adj stop C-NO close
EL-140/141 - The counter balance/weight on the arm/lever should be adjusted for correct operation.

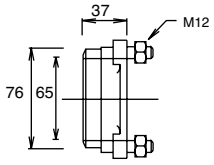
DRILLING DETAIL:

EL-041 DIRECT MOUNTING

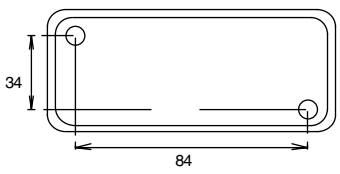


Use M12 studs to project 30mm

EL-MF.. WELDED MATING FLANGE



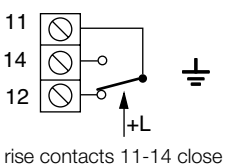
ETF-1



ACCESSORIES: WELDED MATING FLANGE for EL-041, 141 **EL-MF** Carbon Steel **EL-MF/ST** Stainless Steel

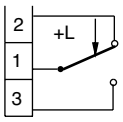
WIRING:

EL..



On level rise contacts 11-14 close 11-12 open.
On level fall contacts 11-12 close 11-14 open.

ETF..



On level rise contacts 1-3 close 1-2 open.
On level fall contacts 1- 2 close 1-3 open.

LIQUID LEVEL TRANSMITTER 4-20MA ULTRASONIC

ELU-8

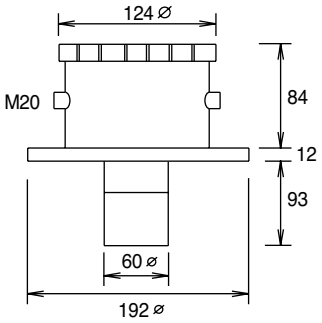
- Used to measure fluid depth or target distance in tanks or sumps / slurries. The unit produces a 4-20mA output signal linear across the desired measuring range. Suitable for use with BMS systems. The unit eliminates spurious echoes and ensures a steady output.

- Accuracy 0.25% of measuring range.
- Pressure -0.25 / +2 bar
- Programmable display : 4 digit concealed
- Flange mounting : DN80 PN16, BS10 TABLE D 3î, ANSI 3î.
- Load at 24VDC 250Ω
- Ultrasonic cone angle 12°
- Materials : UPVC, Polypropylene
- The unit is not suitable for use with any media that has visible fumes.

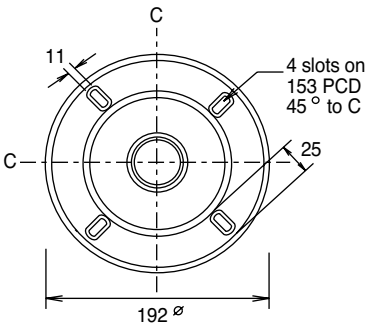
Type	Measuring Range	Operating Temp °C	Span Min	Resolution	Supply ± 15%	Output 2 wire	Max Power	Protection
ELU-8	0.5 / 8m	-10/+60	100mm	1mm	24VDC	4-20mA loop	0.5W	IP68

DIMENSIONS

SIDE VIEW

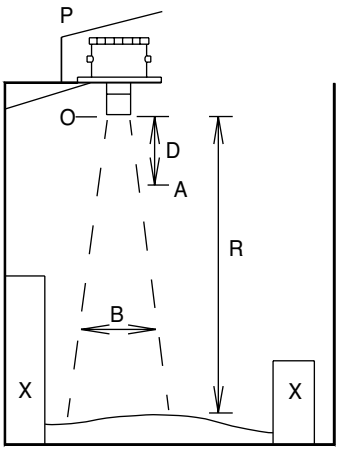


PLAN VIEW

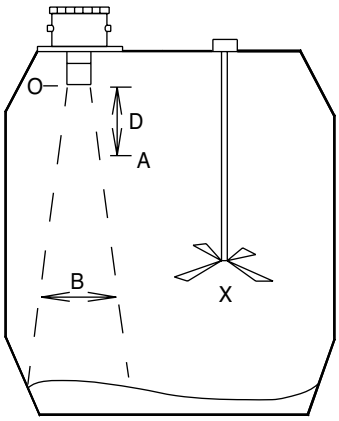


INSTALLATION:

OPEN TANK / SUMP



CLOSED TANK



O : Origin of measurement. All measurements (distances / depths) are taken from O.
D : Dead band 500mm.
A : Max media height for signal range. If measurement is required to the top of the tank, mount the transmitter 500mm higher.
P : Protect the unit from sunlight.
B : Beam width 0.21 x Range (R)
X : Beam must not touch any obstacles. Ensure that the beam path is uninterrupted.

Mounting :

OPEN TANK ñ Mount at least 0.5m above the highest media level and 105mm away from walls for every 1m of media depth.
CLOSED TANK ñ Mount at least 0.5m above the highest media level. Do not mount the unit in the centre of the tank to monitor powder or granules etc. which can form into a cone shape and give inaccurate readings - in this case the unit should be mounted close to the edge as shown.

Use plastic mounting bolts. Do not over-tighten as this may cause acoustic coupling to the mounting and give false readings.
The transmitter must be mounted on the gasket supplied.

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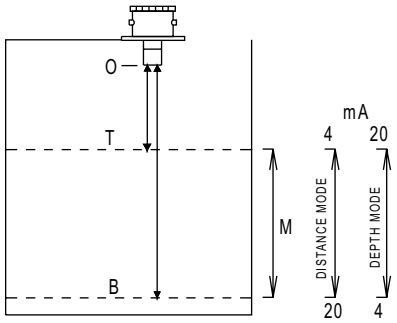
LIQUID LEVEL TRANSMITTER 4-20MA ULTRASONIC

MEASUREMENT :



The unit can be set to read in either Distance or Depth mode.
M : minimum distance between set points must be > 100mm
D : 500mm Dead band O : Start of measurement

Distance Mode :
The 4mA point is required to be closer to 'O' than the 20mA point
ie O-T = 1m = 4mA O-B = 5m = 20mA
At 2m the unit will give an output of 8mA

Depth Mode :
The 20mA point is required to be closer to 'O' than the 4mA point
ie O-T = 1m = 20mA O-B = 5m = 4mA
At 2m the unit will give an output of 16mA

INSTALLATION:

Press the following keys in sequence M ↑ ↓ ↑ ↓. The display now shows 'Ent'

1. Scaling Choose either Manual or Automatic scaling.

Manual Achieved by taking measurement from O to target distance for the 4mA & 20mA points.
Press E to display current setting. To change, press E again & use the ↑ ↓ keys to set the distance (m) for the 4mA setting. Press E to confirm setting - unit displays 'donE' & then the new setting. Press ↑ . Unit now displays current 20mA setting. To change, press E & use the ↑ ↓ keys to set the distance (m) for the 20mA setting. Press E to confirm the setting. The unit displays 'donE' and then the new setting. Press M twice to enter run mode.

Automatic : Achieved by adjusting physical tank contents to the the 4mA & 20mA points
Press ↑ . The unit displays 'Auto'. Press E once and the display will show the 4mA distance of media from the sensor. Press E to store the value. Press E to confirm. Unit displays 'donE' and then displays the current setting. Press ↑ . Unit displays the 20mA distance of media from the sensor. Press E to store the value. Press E to confirm. Unit displays 'donE' and then displays the current setting. Press M twice to enter run mode.

2. Display Selection:

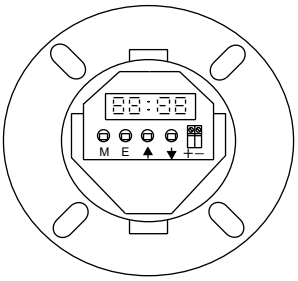
Press keys in sequence M ↑ ↓ ↑ ↓. Unit displays 'Ent' Press ↑ ↑. The unit now displays 'disP'. Press E.
To display depth/distance in metres : Use the ↑ ↓ keys to display depth above 4mA point or distance above 20mA point in metres. Press E to confirm the setting. Unit displays 'donE'. Press M twice to enter run mode.
To display depth/distance as % of range. Use the ↑ ↓ keys to display depth above 4mA point or distance above 20mA point in metres. Press ↓ . The unit now displays 'PerC'. Press E to confirm the setting The unit displays 'donE' Press M twice to enter run mode.

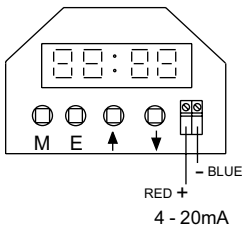
3. Lost Echo Response:

This occurs if the unit fails to receive 'good' echoes. When normal conditions resume, so do output & display.
Press keys in sequence M ↑ ↓ ↑ ↓ ↓. Unit displays 'LE'. Press E. then ↑ ↓ keys to select the 'lost echo' output required :-
Select '20mA' : drive to 20mA OR '4mA' : drive to 4mA OR '21mA' : drive to 21mA OR 'hold' : holds last 'good' reading.
Press E to confirm setting. The unit displays 'donE' Press M twice to enter run mode.

WIRING:

Detail showing keypad and display located under the transmitter cover





Terminals 0.5-1.5mm² Sensor / control signal cable size 7/0.2mm Max length 300m
Screened cable is recommended The screen should be earthed at controller end only
Keep sensor/control signal wires away from power cables/units which may cause interference.

TROUBL E SHOOTING :

1. Unit gives 'Lost Echo' reading 'LE'	Target is out of range or media is too dusty/steamy or excessive foam on liquid surface. Check tank conditions and/or re-site transmitter.
2. Reading not changing with level.	Obstruction interfering with echo ie agitator blade or tank wall. Re-site transmitter away from obstructions.
3. Reading erratic.	Media unsteady or within dead band. Electrical noise interference. Re-site transmitter ensuring media is 500mm away. Check wiring.
4. Reading occasionally high when tank not full.	Close range echo being detected. Acoustic coupling to mounting bracket. Re-site transmitter. Fit foam gasket and loosen mounting bolts.
5. No Display / Loop current.	Power failure. Check power supply.
6. Display reads " ‾‾‾‾" or "_ _ _ _ "	Media over or under range ie outside the 4-20mA setpoints. Reset the unit.
7. Display reads "Err"	4mA & 20mA setpoints are within 100mm of each other. Reset the unit.

PRESSURE

AIR DIFFERENTIAL PRESSURE SWITCHES

EDA.. EFS..

To monitor air flow, dirty filters, flue draught, frost on coils & level. For positive, negative, vacuum & differential pressure. Suitable for non-corrosive, non-combustible air/gases.

Adjustment under cover Volt free contacts

Enclosure:
EDA.. : Glass filled polycarbonate
EFS.. : Steel zinc plated

EFS-02HT - High Temperature model includes -
2 x Brass Duct Adaptors for 6mm OD metal tube.

Ensure that the pressure line is at least 1m long.

Conversion: 1 mbar = 100 Pa Max. ambient 70°C

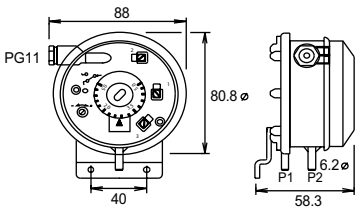
Enclosure Flammability:
EDA.. = UL94-V0
W = UL94-V2

Type	Range mb	Diff mbar approx	Max Press. mbar	230VAC SPDT	Media Temp °C	Diaphragm Material	Pressure Connections	Enclosure
EDA-22	0.2/3	0.1/0.4	50	1(0.5)A	-20/+85	Silicone	6mm push-on	IP54
EDA-33	0.5/5	0.2/0.7	50	1(0.5)A	-20/+85	Silicone	6mm push-on	IP54
EDA-44	1/10	0.3/1	50	1(0.5)A	-20/+85	Silicone	6mm push-on	IP54
EDA-55	5/20	0.5/2	50	1(0.5)A	-20/+85	Silicone	6mm push-on	IP54
EDA-22/IP65	0.2/3	0.1/0.4	50	1(0.5)A	-20/+85	Silicone	6mm push-on	IP65
EDA-33/IP65	0.5/5	0.2/0.7	50	1(0.5)A	-20/+85	Silicone	6mm push-on	IP65
EDA-44/IP65	1/10	0.3/1	50	1(0.5)A	-20/+85	Silicone	6mm push-on	IP65
EDA-55/IP65	5/20	0.5/2	50	1(0.5)A	-20/+85	Silicone	6mm push-on	IP65
EDA-22W	0.2/3	0.1/0.4	50	1(0.5)A	-20/+85	Silicone	6mm push-on	IP65
EDA-33W	0.5/5	0.2/0.7	50	1(0.5)A	-20/+85	Silicone	6mm push-on	IP65
EDA-44W	1/10	0.3/1	50	1(0.5)A	-20/+85	Silicone	6mm push-on	IP65
EDA-55W	5/20	0.5/2	50	1(0.5)A	-20/+85	Silicone	6mm push-on	IP65
EFS-02	0.13/30	0.05/2	35	10(2)A	80	Nitrile	6mm comp	IP30
EFS-02HT*	0.13/30	0.05/2	35	10(2)A	>80	Nitrile	6mm comp	IP30

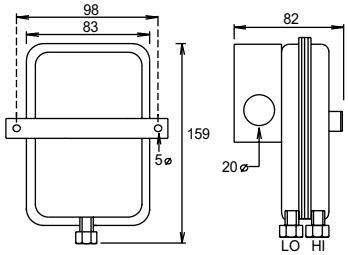
* includes 2x EE-BFN and 2x 2m long 10mm copper tube

DIMENSIONS

EDA..



EFS..

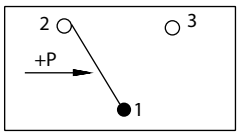


ACCESSORIES:

EE-BFN Brass duct flange for 6mm OD metal tube
EE-CT6 Copper tube 6mm OD x 10m for EFS..
EE-D1 Duct kit 2m EE-PH + 2xEE-PT for EFS-02
EE-D2 Duct kit 2m EE-PH + 2xEE-PT for EDA..
EE-PH15 PVC hose 5x8mm. x 15 metres
EE-PT 70mm Plastic duct adaptor for use with PVC hose
EE-TE Plastic T connector for use with PVC hose
EE-TA Plastic straight connector for use with PVC hose
EE-TY Plastic Y connector for use with PVC hose

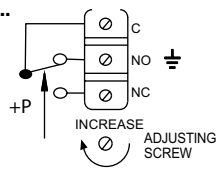
WIRING:

EDA..



On pressure rise to scale setting (range) contacts 1
On pressure fall (diff.) contacts 1-2 (C-NC) close.

EFS..



-3 (C-NO) close.

INSTALLATION:

Port + P1 HI = High Pressure .. connect to fan discharge or high pressure side of filter.
Port – P2 LO = Low Pressure .. connect to fan suction or low pressure side of filter.
The LP Port can be left open for fan/air flow monitoring. To monitor vacuum - connect the low pressure port to high vacuum side.
Mount vertically as shown. Units can be mounted in other positions but may need a slightly higher pressure to operate.

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PRESSURE SWITCHES GAS - AIR - LIQUID

EPG..

- Suitable to monitor the pressure of water, gas, air or oil and switch in the event of high or low pressure conditions. Two switches must be used if both high and low pressures are to be monitored.

EPG..

Volt free contacts

A filter fitted before the switch is highly recommended.

Adjustment under the cover

The pressure line can be formed into a U shape/syphon for media temperatures up to 300°C.

Not suitable for dirty, heavy or aggressive fluids.

Ambient -20/+85 °C mbar x 100 = Pa

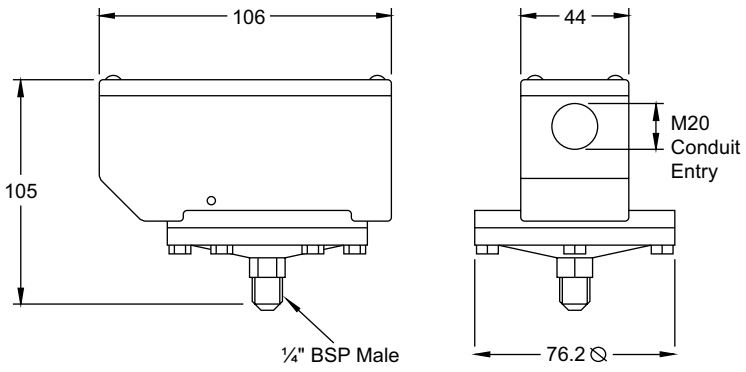
Enclosure: Zinc diecast with glass filled nylon lid

All settings/differentials are approximately +/-2% due to mechanical tolerances.

Type	Range mbar	Diff mbar	Max Press mbar	230VAC SPDT	Media Contact Materials	Max Media Temp °C	Pressure Connections	Enclosure
EPG-125	5/125	2.5	500	5(2)A	Brass Beryllium Copper Nitrile Rubber	85	¼" BSP Male	IP65
EPG-250	15/250	4	500	5(2)A	Brass Beryllium Copper Nitrile Rubber	85	¼" BSP Male	IP65

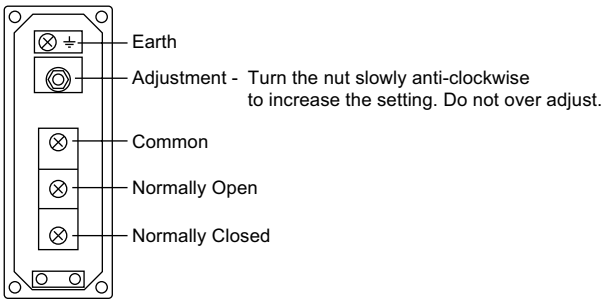
DIMENSIONS

EPG..



WIRING:

EPG..



PRESSURE

LIQUID PRESSURE SWITCHES

EP..

Suitable to monitor static or positive pressure of water, air, oil, diesel, steam** etc & switch in the event of high or low pressure conditions. Two switches must be used if both high and low pressures are to be controlled.

* The minimum differential will gradually increase by approx 60% as the switch setting is increased.

Max. media temp. 80°C

**The pressure line can be formed into a U shape/syphon for media temperatures up to 300°C.

Tamper proof adjustment

Volt free contacts

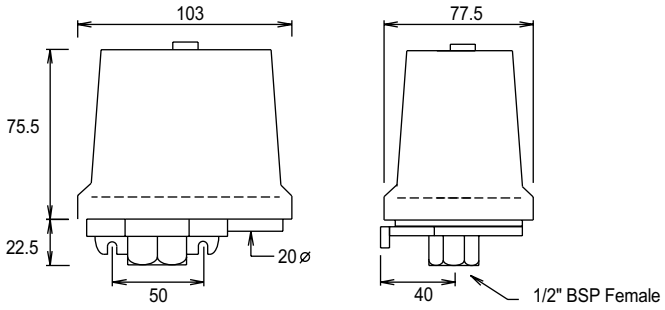
Max. ambient 70°C

Enclosure Flammability = UL94-V2

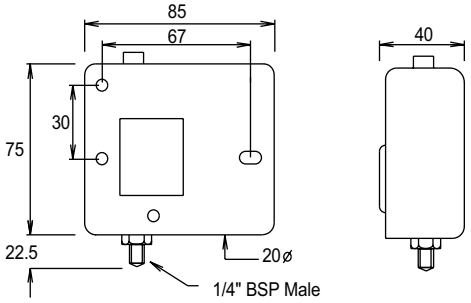
Type	Range Bar	Diff Bar	Max Press. Bar	230VAC SPDT	Media Contact Materials	Pressure Connections	Enclosure
EP-2	0.1/2	* 0.07/1.9	40	16(6)A	Cast Aluminium/Nitrile	½" BSP Female	IP65
EP-4	0.2/4	* 0.15/3.7	40	16(6)A	Cast Aluminium/Nitrile	½" BSP Female	IP65
EP-8	0.5/8	* 0.3/7.5	40	16(6)A	Cast Aluminium/Nitrile	½" BSP Female	IP65
EP-16	1/16	* 0.6/15	48	16(6)A	Cast Aluminium/Nitrile	½" BSP Female	IP65
EP-4M	0.2/4	hand reset open high	40	16(6)A	Cast Aluminium/Nitrile	½" BSP Female	IP65
EP-4ML	0.2/4	hand reset open low	40	16(6)A	Cast Aluminium/Nitrile	½" BSP Female	IP65
EP-003	0.3/3	0.25/2	12	24(10)A	Brass Tin Plated/Phosphor Bronze	¼" BSP Male	IP40
EP-008	0.5/8	0.5/5	12	24(10)A	Brass Tin Plated/Phosphor Bronze	¼" BSP Male	IP40

DIMENSIONS

EP-2..32

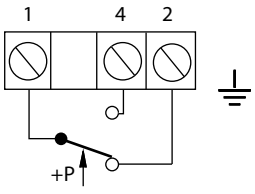


EP-003 / 008

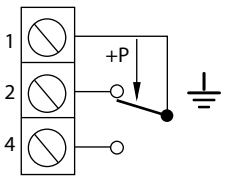


WIRING:

EP-2..32



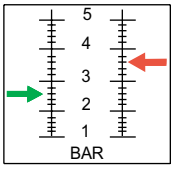
EP-003 / 008



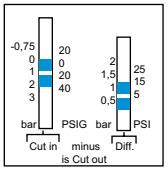
EP..	On pressure rise to scale setting (range) 1-4 close	..	On pressure fall (diff) contacts 1-2 close.
EP..M	Open high = Contacts 1-2 open on pressure rise	..	Pressure must fall to allow resetting.
EP..ML	Open low = Contacts 1-4 open on pressure fall	..	Pressure must rise to allow resetting.

SETTING:

EP-2..32



EP-003 / 008



EP-2..32 : Set the RED arrow FIRST to the High switch point, then set the GREEN arrow to the Low switch point. The differential is RED minus GREEN setting.

EP-003 / 008 : Set the RANGE FIRST to the High switch point , then set the DIFF to the Low switch point, the differential is RANGE minus DIFF setting.

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LIQUID DIFFERENTIAL PRESSURE SWITCHES

EP..

These units can be used to monitor the flow of liquids across pumps, boilers, chillers, valves etc. They can also be used to monitor dirty filter conditions. Suitable for water, air, oil, diesel and up to 30% glycol etc.
Type EP-099/100/101 are suitable for low pressure applications ie below 0.4 bar.

EP-113 EP-100

Max. media temp. 80°C

If the low pressure port is left open, these switches can then be used as normal standard pressure switches.

Volt free contacts

Max. ambient 70°C

Enclosure Flammability = UL94-V1

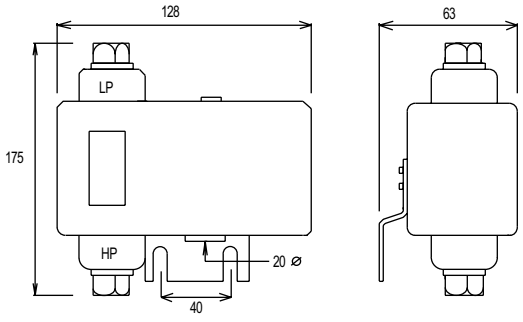
Type	Range	Diff	Max Press Press. Bar	230VAC SPDT	Media Contact Materials	Pressure Connections	Enclosure
EP-113	0.2/4 bar	0.1 bar	12	5(2)A	Brass/Phosphor Bronze	¼" BSP Female	IP40
EP-114W	0.07/1 bar	0.05 bar	34	5(3)A	Copper / Nitrile / Brass	I " BSP Female	IP65
EP-115W	0.2/4 bar	0.1 bar	34	5(3)A	Copper / Nitrile / Brass	I " BSP Female	IP65
EP-099	8/125 mbar	6 mbar	14	5(3)A	Copper / Nitrile / Brass	I " BSP Female	IP65
EP-100	15/250 mbar	7 mbar	34	5(3)A	Copper / Nitrile / Brass	I " BSP Female	IP65
EP-101	25/400 mbar	10 mbar	34	5(3)A	Copper / Nitrile / Brass	I " BSP Female	IP65

SELECT A SWITCH WHICH CAN BE SET WELL BELOW THE SYSTEM DIFFERENTIAL PRESSURE.

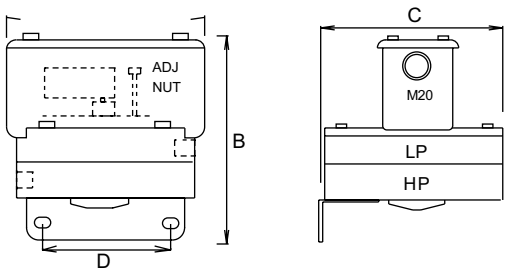
For flow failure applications it is important to have a close switching differential as in our EP.. range.
Switches with a larger differential are generally unsuitable for this application.

DIMENSIONS

EP-113



EP-114W / EP-115W / EP-099 / EP-100 / EP-101



	A	B	C	D
EP-114W / EP-115W	106	125	86	51
EP-099 / EP-100 / EP-101	106	125	96	51

Mounting at any angle is possible. HP = High Pressure bottom port LP = Low Pressure top port

ACCESSORIES:

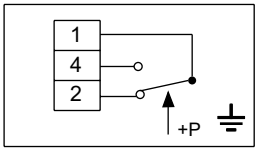
EE-CT6 Copper tube 6mm OD x 10m for Pressure Switches and Transmitters
EE-MC1 Brass Male Compression fitting for 6mm OD tube x I " BSP Brass Male
Compression fitting for 6mm OD tube x ¼" BSP Male

EE-CT6

EE-MC

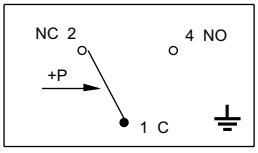
WIRING:

EP-113 / EP-113/ST



On pressure rise to scale setting (range) contacts 1-4 close
Pressure fall (diff) contacts 1-2 close

EP-114W / EP-115W / EP-099 / EP-100 / EP-101



On pressure rise to scale setting (range) contacts 1-4 close
Pressure fall (diff) contacts 1-2 close

ADJUSTMENT:

EP-113.. Remove cover & with a screwdriver, turn the slotted wheel above the scale to the left to increase the setting.
OTHER MODELS: The adjusting nut is under the cover - Turn it slowly anti-clockwise to increase setting. Do NOT over-adjust.

AIR DIFFERENTIAL PRESSURE TRANSMITTERS 0-10 VDC / 4-20MA

EDT..

These devices measure vacuum, pressure or differential pressure of air and non-combustible, non-aggressive gases across fans, filters, air flow devices etc and give a 0-10vdc output signal linear across the range. Suitable for air conditioning, ventilation and building management systems.
Models with square root extracted output are available on request.
The duct kit EE-D2 is included.

EDT.. EDT..V

Accuracy		<1%
Max ambient		70°C
Consumption at	0-10VDC	10mA
nom pressure	4-20mA	20mA
Load	0-10VDC	10KΩ
	4-20mA at 24VDC	0.8KΩ
Response time		<20ms
Media contact materials		Ceramic/Silicon
Max media temp		70°C
Max pressure one side	< 3mb	50mb
	> 3mb	100mb
Enclosure polycarbonate	lid	UL94-HB
	hsng	UL94-V2

1 mbar = 100Pa

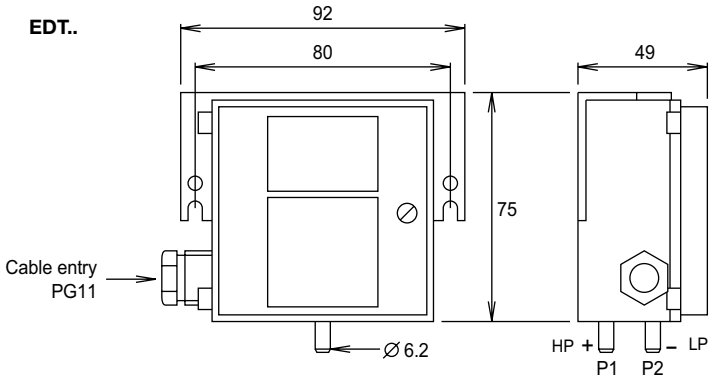
Type	Range mb	Max press mb	Supply +/- 15%	Output Signal	Pressure Connections	Enclosure
EDT+-0.3/0.5/1	+-0-0.3/0-0.5/0-1 selectable	50	24VAC/DC	0-10VDC	6.2mm Push on	IP65
EDT-1/3/5	0-1/0-3/0-5 selectable	50	24VAC/DC	0-10VDC	6.2mm Push on	IP65
EDT-10/16/25	0-10/0-16/0-25 selectable	100	24VAC/DC	0-10VDC	6.2mm Push on	IP65

EDT-…MA As above but 2 wire loop powered 4-20mA output
EDT-…V as above but with digital display

Other variants on request

DIMENSIONS

EDT..



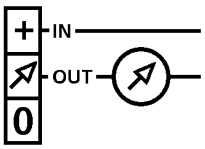
SETTING RANGES	EDT-selectable		
			1
			0
Pressure range			
High	0	0	
Medium	0	1	
Low	1	0	
For the EDT..V follow the instructions inside the lid			

ACCESSORIES:

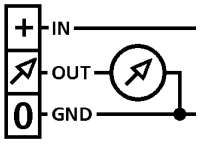
EE-BFN Brass duct flange for 6mm OD metal tube
EE-D2 Duct kit 2m EE-PH + 2xEE-PT for EDA..
EE-PH15 PVC hose 5x8mm x 15 metres
EE-PT 70mm Plastic duct adaptor for use with PVC hose
EE-TE Plastic T connector for use with PVC hose
EE-TA Plastic straight connector for use with PVC hose
EE-TY Plastic Y connector for use with PVC hose

WIRING:

EDT..

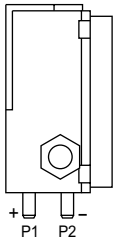


EDT..MA



Use minimum cable size of 7/0.2mm
Max cable length 100m / 0-10vdc 300m / 4-20mA
Screened cable is recommended.
The screen should be earthed at controller end only.
Keep away from power cables/units which may cause Interference.

INSTALLATION:



Mount vertically as shown.

Mounting with lid facing down will increase the reading by approx. 0.1mbar.
Mounting with lid facing up will decrease the reading by approx. 0.1mbar.

Always press the RESET button after installation to zero these errors.

Port P1 + = High Pressure .. connect to fan discharge or high pressure side of filter.
Port P2 - = Low Pressure .. connect to fan suction or low pressure side of filter.

The low pressure port can be left open for fan/air flow monitoring
To monitor vacuum - connect the low pressure port to the high vacuum side.

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LIQUID PRESSURE TRANSMITTERS 0-10 VDC / 4-20MA

EWT..

These units can be used to measure static or positive pressure changes of water, air, oil, refrigerants, steam or other non-combustible fluids and give a 0-10vdc / 4-20mA output signal linear across the pressure range. Suitable for heating, air conditioning and building management systems.

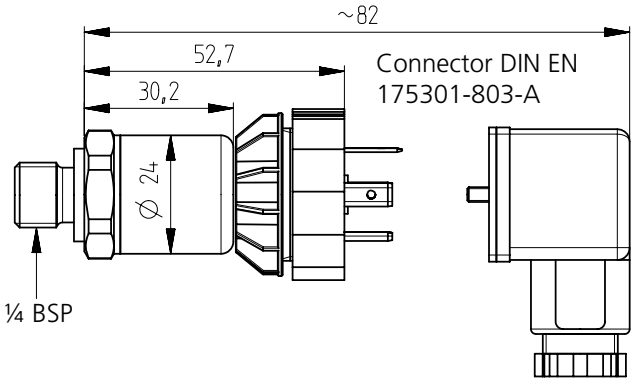
EWT..

Accuracy		<0.5%
Max ambient		85°C
Consumption at nom pressure		
	0-10VDC	7mA
	4-20mA	23mA
Load	0-10VDC	10KΩ
	4-20mA at 24VDC	0.85KΩ
Response time		<10ms
1 mbar = 100Pa		

Type	Range Bar	Max Press. Bar	Supply ± 10%	Output Signal	Max Media Temp °C	Media Contact Materials	Pressure Connections	Enclosure
EWT- 006	0/0.6	1.8	24VAC/DC	0-10 vdc	-20/+100	Ceramic/Stainless Steel/EPDM	¼"BSP Male	IP65
EWT- 01.6	0/1.6	4.8	24VAC/DC	0-10 vdc	-20/+100		¼"BSP Male	IP65
EWT- 02.5	0/2.5	7.5	24VAC/DC	0-10 vdc	-20/+100		¼"BSP Male	IP65
EWT- 4	0/4	12	24VAC/DC	0-10 vdc	-20/+100		¼"BSP Male	IP65
EWT- 6	0/6	12	24VAC/DC	0-10 vdc	-20/+100		¼"BSP Male	IP65
EWT- 10	0/10	20	24VAC/DC	0-10 vdc	-20/+100		¼"BSP Male	IP65
EWT- 16	0/16	32	24VAC/DC	0-10 vdc	-20/+100		¼"BSP Male	IP65
EWT- 25	0/25	50	24VAC/DC	0-10 vdc	-20/+100		¼"BSP Male	IP65
EWT- 40	0/40	80	24VAC/DC	0-10 vdc	-20/+100		¼"BSP Male	IP65
EWT- 01.6/DMA	0/1.6	4.8	24VDC	4-20 mA loop	-20/+100		¼"BSP Male	IP65
EWT- 02.5/DMA	0/2.5	7.5	24VDC	4-20 mA loop	-20/+100		¼"BSP Male	IP65
EWT- 4/DMA	0/4	12	24VDC	4-20 mA loop	-20/+100		¼"BSP Male	IP65
EWT- 6/DMA	0/6	12	24VDC	4-20 mA loop	-20/+100		¼"BSP Male	IP65
EWT- 10/DMA	0/10	20	24VDC	4-20 mA loop	-20/+100		¼"BSP Male	IP65
EWT- 16/DMA	0/16	32	24VDC	4-20 mA loop	-20/+100		¼"BSP Male	IP65
EWT- 25/DMA	0/25	50	24VDC	4-20 mA loop	-20/+100		¼"BSP Male	IP65

DIMENSIONS

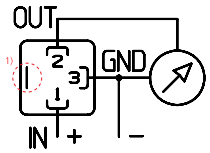
EWT..



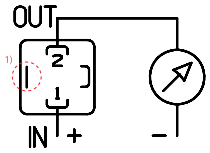
Mounting at any angle is possible.

WIRING:

EWT..



EWT../DMA



Min sensor / control signal cable size 7/0.2mm Max length 100m. The screen should be earthed at controller end only.
Keep sensor/control signal wires away from power cables/units which may cause interference. Screened cable is recommended.

LIQUID DIFFERENTIAL PRESSURE TRANSMITTERS 0-10 VDC / 4-20MA

EWDT..

These units can be used to mesure pressure or differential pressure of water, up to 30% glycol or other neutral fluids across pumps, boilers, chillers, valves etc. The 0-10vdc output signal is linear across the range. Suitable for heating, air conditioning and building management systems. For liquid levels 1m depth of water = 100mbar

EWDT..

Accuracy	up to 2.5 bar	1.25%
	up to 4 bar	0.75%
	up to10bar	0.5%
Max ambient		85°C
Consumption at nom press		20mA
Load	0-10VDC	10KΩ
	4-20mA at 24VDC	0.65KΩ
Response time		<10ms
System pressure	up to 6bar	25bar
	>10bar	50bar

1mbar = 100Pa

Type	Range	Max * Press.	Supply ± 10%	Output Signal	Max Media Temp °C	Media Contact Materials	Pressure Connections	Enclosure
EWDT-001	0/100 mbar	0.6 Bar	24VAC/DC	0-10 vdc	-15/+80*	Ceramic/Stainless Steel/EPDM	6mm Compression	IP65
EWDT-002	0/200 mbar	1.2 Bar	24VAC/DC	0-10 vdc	-15/+80*		6mm Compression	IP65
EWDT-025	0/250 mbar	1.2 Bar	24VAC/DC	0-10 vdc	-15/+80*		6mm Compression	IP65
EWDT-004	0/400 mbar	2 Bar	24VAC/DC	0-10 vdc	-15/+80*		6mm Compression	IP65
EWDT-005	0/500 mbar	3 Bar	24VAC/DC	0-10 vdc	-15/+80*		6mm Compression	IP65
EWDT-006	0/600 mbar	3 Bar	24VAC/DC	0-10 vdc	-15/+80*		6mm Compression	IP65
EWDT-1	0/1 bar	5 Bar	24VAC/DC	0-10 vdc	-15/+80*		6mm Compression	IP65
EWDT-1.6	0/1.6 bar	12 Bar	24VAC/DC	0-10 vdc	-15/+80*		6mm Compression	IP65
EWDT-2.5	0/2.5 bar	12 Bar	24VAC/DC	0-10 vdc	-15/+80*		6mm Compression	IP65
EWDT-4	0/4 bar	12 Bar	24VAC/DC	0-10 vdc	-15/+80*		6mm Compression	IP65
EWDT-6	0/6 bar	12 Bar	24VAC/DC	0-10 vdc	-15/+80*		6mm Compression	IP65
EWDT-10	0/10 bar	20 Bar	24VAC/DC	0-10 vdc	-15/+80*		6mm Compression	IP65

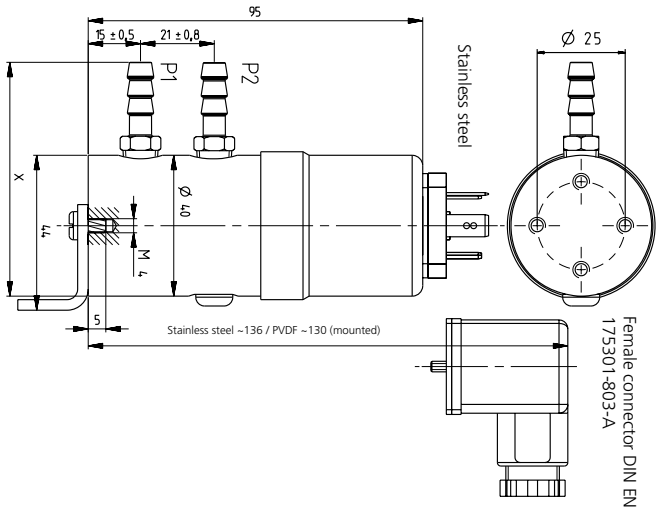
* Tolerable overload one side

Other variants on request

OPTIONAL: **EWDT..MA** 4-20m output 2 wire loop

DIMENSIONS

EWDT..



ACCESSORIES:

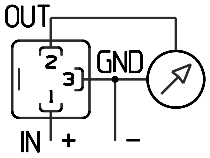
EE-CT6 Copper tube 6mm OD x 10m for Pressure Switches and Transmitters
EE-MC1 Brass Male Compression fitting for 6mm OD tube x I " BSP Male
EE-MC2 Brass Male Compression fitting for 6mm OD tube x ¼" BSP Male

EE-CT6

EE-MC

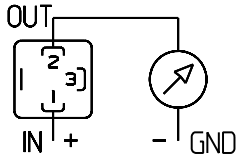
WIRING:

EWDT..



Min sensor / control signal cable size 7/0.2mm
Screened cable is recommended. Max cable length 100m.

EWDT..MA



Keep away from power cables/units which may cause interference.
The screen should be earthed at controller end only.

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DAMPER / VALVE MOTORS 4NM 2 & 3 POINT

EK4..

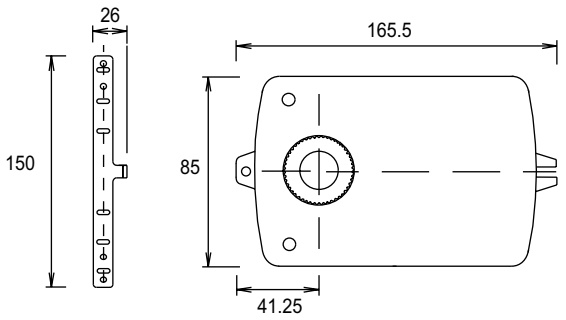
These small motors can be fitted directly onto air damper shafts as used in HVAC systems. They are also suitable for use on control valves. The rotary action can be used to open & close dampers, valves etc.

The motor stops automatically when the end positions are reached.
Up to 5 motors can be wired in parallel.
Max. ambient -20/+50°C
Max angle of rotation 90°
Adj. angle of rotation limiter 0-30° & 90-60°
Reversible position indication 0-10, 10-0
Noise level 40dB Manual Override
Supply : 24VAC±15% 230VAC±10%
Enclosure Flammability = UL94-V0

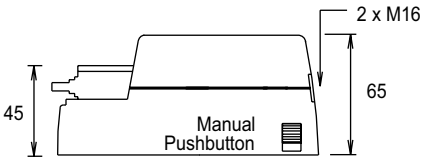
Type	Supply 50/60Hz	Operation	Aux Switch 230VAC SPDT	Run Time Approx	Torque	Damper Area Approx	Consumption VA	Enclosure
EK4-24	24VAC/DC	2 & 3 Point	--	35s	4Nm	1m²	4.1	IP44
EK4-24S	24VAC/DC	2 & 3 Point	2 x 3(1.5)A	35s	4Nm	1m²	4.1	IP44
EK4-230	230VAC	3 Point ONLY	--	35s	4Nm	1m²	5	IP44
EK4-230S	230VAC	3 Point ONLY	2 x 3(1.5)A	35s	4Nm	1m²	5	IP44

DIMENSIONS

Anti-Rotation Bracket



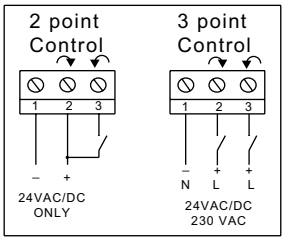
DIRECT MOUNTING : Shaft size - Round 6 -16mm



1 off M16 male to M20 female conduit adapter included.
2 off with Aux switch models.

WIRING:

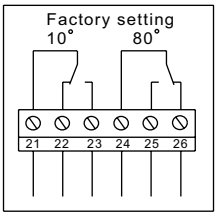
24VAC/DC - 2 & 3 Point Control
230VAC - 3 Point Control ONLY



2 POINT CONTROL
Clockwise 1 Neutral 2 Live
Anti-clockwise 1 Neutral 2 + 3 Live

FLOATING / 3 POINT CONTROL
Clockwise 1 Neutral 2 Live 3 open
Anti-clockwise 1 Neutral 2 open 3 Live

Auxiliary Switches



Example:

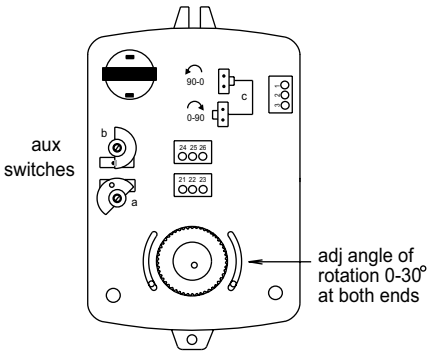
Motor anti-clockwise
21-22 closed at 10° and below.

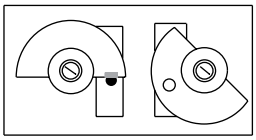
Motor clockwise
24-25 closed at 80° and above.

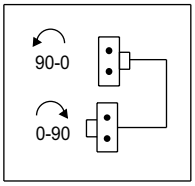
NO BACK VOLTAGE FROM SUPPLY TERMINALS.

MOTOR STARTS AUTOMATICALLY AFTER MANUAL ADJUSTMENT.

SETTING:







2 x Auxiliary switches Adjustable 0-90°

Manually set the motor to the required switching point & rotate the cam wheel just over the microswitch button. Set the second switching point by repeating this using the second cam wheel.

Direction of Rotation

The direction of rotation is changed by reversing the plug.

DAMPER ACTUATORS / VALVE MOTORS

DAMPER / VALVE MOTORS 4NM MODULATING

EK4-24M

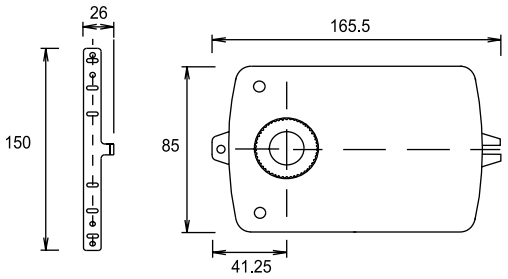
These small motors can be fitted directly onto air damper shafts as used in HVAC systems. They are also suitable for use on control valves. The rotary operation modulates according to the 0-10vdc signal in order to open and close dampers, valves etc.

The motor stops automatically when the end positions are reached.
Up to 5 motors can be wired in parallel.
Max. ambient -20/+50°C
Max angle of rotation 90°
Adjustable angle of rotation limiter 0-30° & 90-60°
Reversible position indication 0-10, 10-0
Noise level 40dB Manual Override
Supply : 24VAC/DC±15%
Enclosure Flammability = UL94-V0

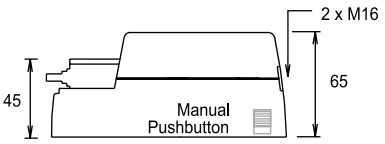
Type	Supply 50/60Hz	Input	Run Time Approx	Torque	Damper Area Approx	Consumption VA	Enclosure
EK4-24M	24VAC/DC	0-10vdc	35s	4Nm	1m²	3.5	IP44

DIMENSIONS

Anti-Rotation Bracket

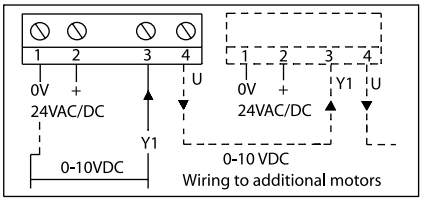


DIRECT MOUNTING : Shaft size - Round 6 -16mm

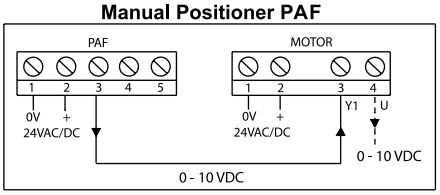


WIRING:

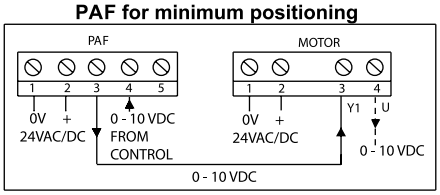
EK4-24M



Manual Positioner PAF



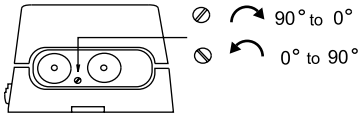
PAF for minimum positioning



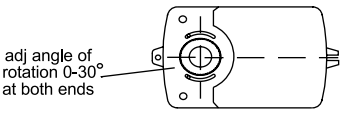
INPUT RESISTANCE Y1 > 100KΩ LOAD RESISTANCE U > 50KΩ
ON POWER CUT THE MOTOR STOPS. IF THE INPUT SIGNAL IS CUT, THE MOTOR RETURNS TO 0VDC POSITION
Terminals 0.5-2.5mm² Min sensor cable size 7/0.2mm Max length 100m. Screened cable is recommended.
The screen should be earthed at controller end only Keep sensor wires away from power cables/units which may cause interference.

SETTING:

Direction of Rotation



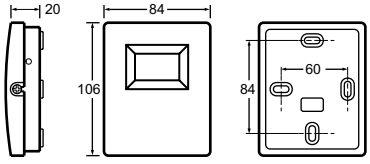
Angle of Rotation



ACCESSORIES:

PAF Digital Positioner
0-100%
Wall Mounting

Dimensions (mm)



Supply 24VAC/DC
Output 0-10VDC (0-100%)
Steps 1%

Output 0-10vdc or 2-10vdc selectable

T: +44 (0) 1480 407074 \ F: +44 (0) 1480 407076

DAMPER / VALVE MOTORS 2 & 3 POINT

E08.. E16.. E24.. E32..

These motors can be fitted directly on to air damper shafts or remotely using linkage accessories in HVAC systems. They are also suitable for use on control valves. The rotary operation can be used to open and close dampers, valves etc.

E08.. E16.. E24.. E32..

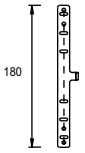
Up to 10 motors can be wired in parallel.
Max. ambient -20/+50°C
The motor stops automatically when the end positions are reached.
Angle of rotation 0-90° adjustable
Reversible position indication 0-10, 10-0
Noise level 45dB Manual Override
Supply : 24VAC ±20% 24VDC ±10% 230VAC ±10%
24V=6.5VA 230V=6VA
Enclosure Flammability = UL94-V0
***FOR WEATHERPROOF ENCLOSURES SEE SEPARATE DATA SHEET.**

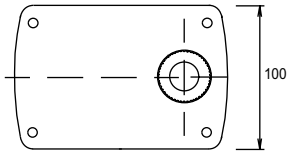
Type	Supply 50/60Hz	Operation	Aux Switch 230VAC	Run Time Approx	Torque	Damper Area Approx	Enclosure
E08-24	24VAC/DC	2 & 3 Point	–	30s	8Nm	2m	IP44
E08-24S	24VAC/DC	2 & 3 Point	2 x 3(1.5)A	30s	8Nm	2m	IP44
E08-230	230VAC	2 & 3 Point	–	30s	8Nm	2m	IP44
E08-230S	230VAC	2 & 3 Point	2 x 3(1.5)A	30s	8Nm	2m	IP44
E16-24	24VAC/DC	2 & 3 Point	–	80s	16Nm	4m	IP44
E16-24S	24VAC/DC	2 & 3 Point	2 x 3(1.5)A	80s	16Nm	4m	IP44
E16-230	230VAC	2 & 3 Point	–	80s	16Nm	4m	IP44
E16-230S	230VAC	2 & 3 Point	2 x 3(1.5)A	80s	16Nm	4m	IP44
E24-24	24VAC/DC	2 & 3 Point	–	125s	24Nm	6m	IP44
E24-24S	24VAC/DC	2 & 3 Point	2 x 3(1.5)A	125s	24Nm	6m	IP44
E24-230	230VAC	2 & 3 Point	–	125s	24Nm	6m	IP44
E24-230S	230VAC	2 & 3 Point	2 x 3(1.5)A	125s	24Nm	6m	IP44
E32-24	24VAC/DC	2 & 3 Point	–	140s	32Nm	8m	IP44
E32-24S	24VAC/DC	2 & 3 Point	2 x 3(1.5)A	140s	32Nm	8m	IP44
E32-230	230VAC	2 & 3 Point	–	140s	32Nm	8m	IP44
E32-230S	230VAC	2 & 3 Point	2 x 3(1.5)A	140s	32Nm	8m	IP44

SPECIAL ORDER ONLY

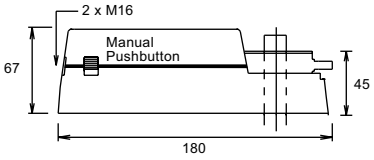
DIMENSIONS

Anti-Rotation Bracket





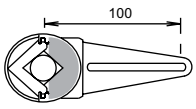
DIRECT MOUNTING : Shaft size - Round 10-20mm Square 10-16mm



1 off M16 male to M20 female conduit adapter included.
2 off with Aux switch models.

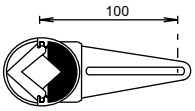
ACCESSORIES:

ZKH



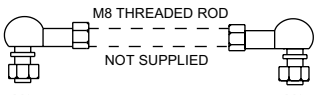
Motor Crank Arm

ZKA



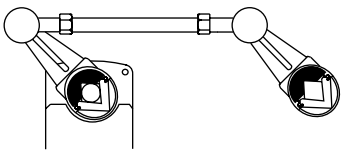
Damper Crank Arm

ZKG



Ball Joint

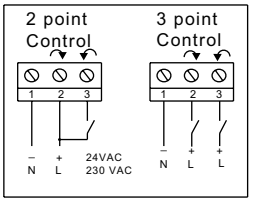
REMOTE MOUNTING

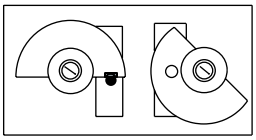


REQUIRES : 2 x ZKG 1 x ZKH 1 x ZKA

WIRING:

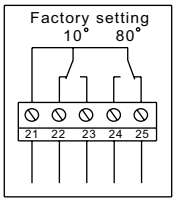
24 / 230 V





2 x Auxiliary switches
Adjustable 0-90°

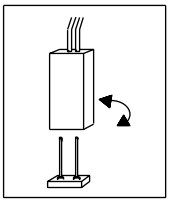
Auxiliary Switches



Example:
Motor anti-clockwise
21-22 closed at 10° and below
Motor clockwise
21-24 closed at 80° and above

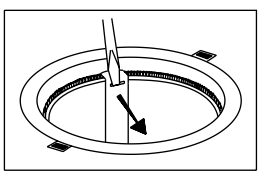
Manually set the motor to the required switching point & rotate the cam wheel just over the microswitch button. To set the second switching point repeat this using the second cam wheel.

Direction of Rotation



The direction of rotation is changed by reversing the polarity of the motor plug.

Adj angle of rotation between 0-90°



Rotation angle is adjusted by repositioning the adapter in 5 steps.The adaptor is released by pressing the locking clip on the underside of the actuator.

Latchable manual override.
No back voltage from supply terminals.
Auto re-start (230V motors) after manual adj.

DAMPER ACTUATORS / VALVE MOTORS

DAMPER / VALVE MOTORS 0-10VDC / 4-20MA

E08..M, E16..M, E24..M, E32..M

These motors can be fitted directly onto air damper shafts or remotely using linkage accessories in HVAC systems. They are also suitable for use on control valves. The rotary operation modulates according to the 0-10vdc / 4-20mA signal in order to open and close dampers, valves etc.

E08..M E16..M E24..M E32..M

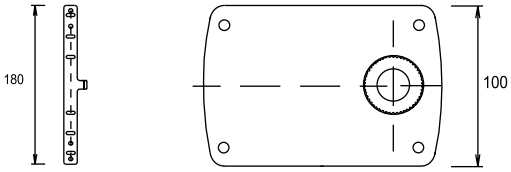
Motor stops automatically when in the end position.
Up to 5 motors can be wired in parallel.
Max. ambient -20/+50°C
Adjustable angle of rotation limiter 0-90°
Reversible position indication 0-10, 10-0
Noise level 45dB Latchable Manual Override
Supply : 24VAC ±20% 24VDC ±10% 230VAC ±10%
24V=7.5VA 230V=6VA
Enclosure Flammability = UL94-V0

***FOR WEATHERPROOF ENCLOSURES SE SEPERATE DATA SHEET.**

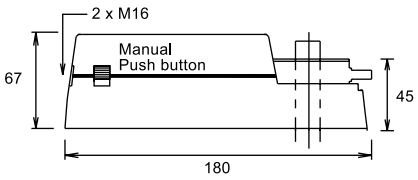
Type	Supply 50/60Hz	Selectable Input	Aux Switch 230VAC	Run Time Approx	Torque	Damper Area Approx	Enclosure	
E08-24M	24VAC/DC	0-10vdc/4-20mA	–	30s	8Nm	2m²	IP44	
E08-24MS	24VAC/DC	0-10vdc/4-20mA	2 x 3(1.5)A	30s	8Nm	2m²	IP44	
E16-24M	24VAC/DC	0-10vdc/4-20mA	–	80s	16Nm	4m²	IP44	
E16-24MS	24VAC/DC	0-10vdc/4-20mA	2 x 3(1.5)A	80s	16Nm	4m²	IP44	
E16-230M	230VAC	0-10vdc/	–	80s	16Nm	4m²	IP44	
E16-230MS	230VAC	0-10vdc/	–	80s	16Nm	4m²	IP44	
E24-24M	24VAC/DC	0-10vdc/4-20mA	–	125s	24Nm	6m²	IP44	SPECIAL ORDER ONLY
E24-24MS	24VAC/DC	0-10vdc/4-20mA	2 x 3(1.5)A	125s	24Nm	6m²	IP44	
E32-24M	24VAC/DC	0-10vdc/4-20mA	–	140s	32Nm	8m²	IP44	

DIMENSIONS

Anti-Rotation Bracket

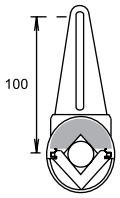


DIRECT MOUNTING :
Shaft size - Round 10-20mm Square 10-16mm



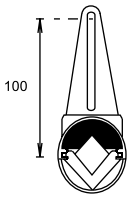
ACCESSORIES:

ZKH



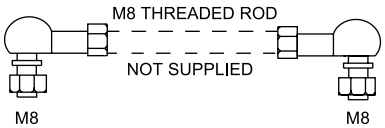
Motor Crank Arm

ZKA



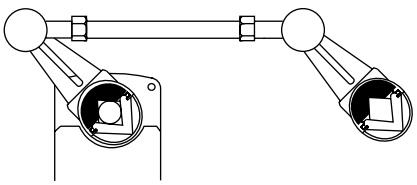
Damper Crank Arm

ZKG



Ball Joint

REMOTE MOUNTING



REQUIRES : 2 x ZKG 1 x ZKH 1 x ZKA

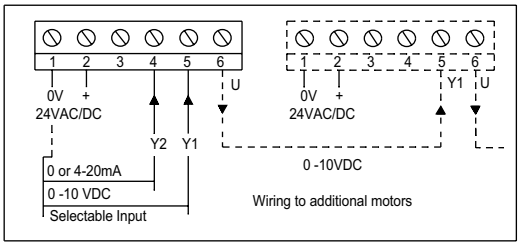
PAF Digital Positioner 0-100% Wall Mounting

T: +44 (0) 1480 407074 \ F: +44 (0) 1480 407076

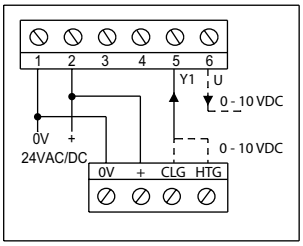
DAMPER / VALVE MOTORS 0-10VDC / 4-20MA

WIRING:

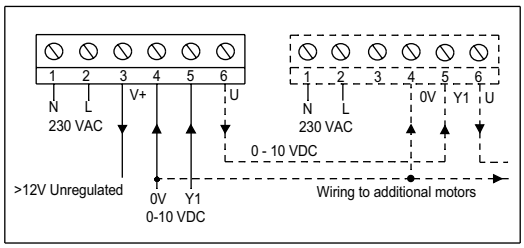
E08-24M, E16-24M, E24-24M, E32-24M



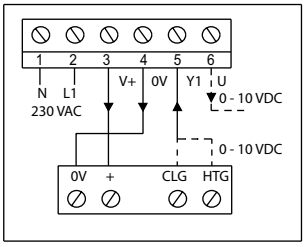
Temperature Controller



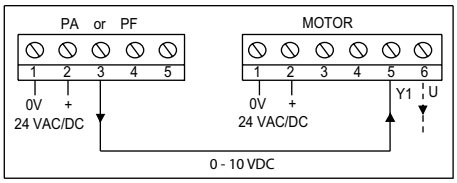
E16-230M



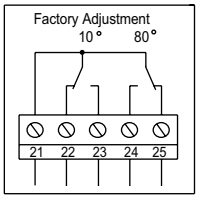
Temperature Controller



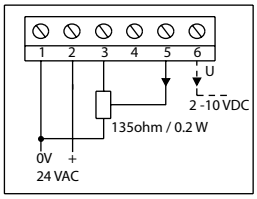
Manual Positioner PAF for E..24M



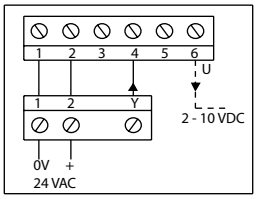
Aux Switches - all ..MS Models



Honeywell 90 E16-20M



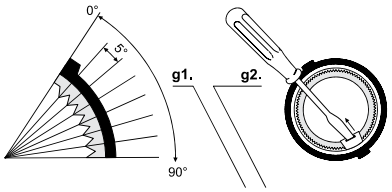
Staefa 0-20v Phase cut E16-20M

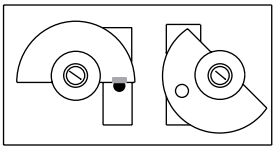


Example
Motor anti-clockwise 21-22 closed at 10° and below
Motor clockwise 21-24 closed at 80° and above

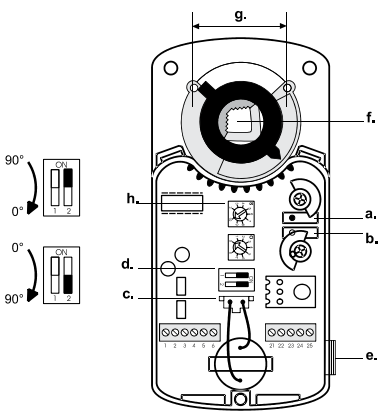
INPUT RESISTANCE Y1 > 100KΩ Y2 500Ω LOAD RESISTANCE U > 50KΩ
ON POWER CUT THE MOTOR STOPS. IF THE INPUT SIGNAL IS CUT, THE MOTOR RETURNS TO 0VDC POSITION.

ADJUSTMENT:





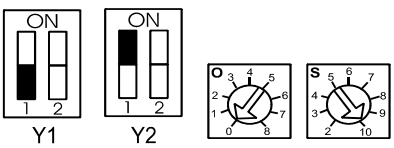
2 x Aux switches Adjustable 0-90°
Manually set the motor to the required switching point & rotate the cam wheel to just over the microswitch button.
To set the second switching point repeat this using the second cam wheel.



(1) **Signal** *(2)* **Potentiometer**

Y1 = DC 0...10 V → O = 0 / S = 10
Y1 = DC 2...10 V → O = 2 / S = 8
Y2 = 0...20 mA → O = 0 / S = 10
Y2 = 4...20 mA → O = 2 / S = 8

(3) **Adapting**



FOR FUNCTIONAL REASONS THE MOTOR PLUG ON MODULATING MOTORS MUST NOT BE REVERSED

INSTALLATION: Min cable size 7/0.2mm or Screened cable is recommended. Max length 100m. The screen should be earthed at controller end only. Keep away from power cables/units which may cause interference.

DAMPER ACTUATORS / VALVE MOTORS

SPRING RETURN DAMPER/VALVE MOTORS ON-OFF/0-10VDC

ER08../ER20..

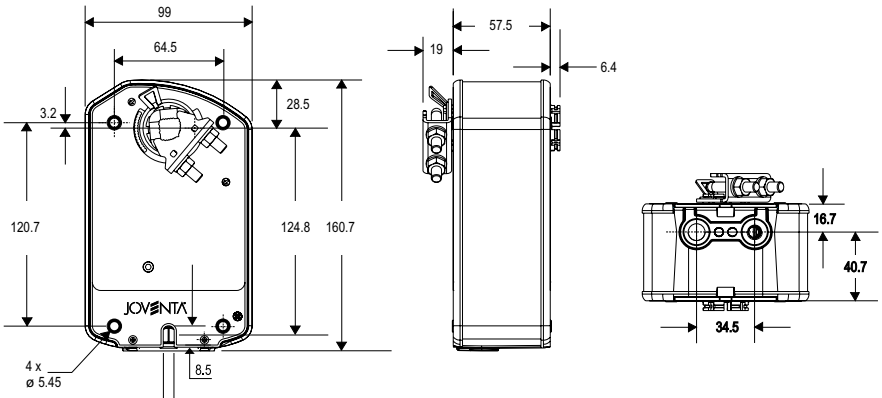
These actuators can be used to control ventilation dampers or valves on applications where safety In the event of loss of power Is critical.
The motor can be mounted directly to a damper shaft or to a valve using a linkage kit.
When the power is on the motor drives or modulates in one direction and when power is removed the motor springs back to the safe position.

The motor stops automatically when the end positions are reached.
Up to 10 motors can be wired in parallel.

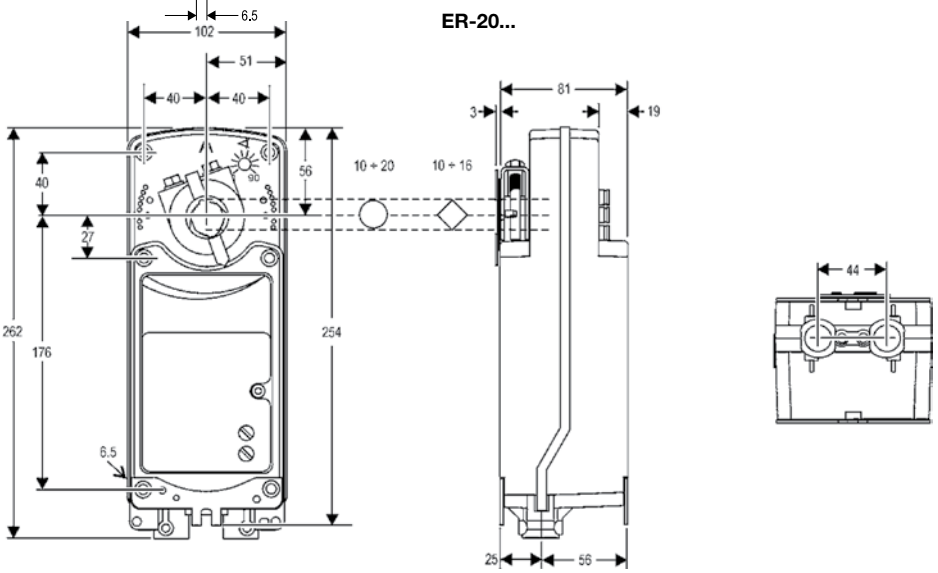
Type	Supply 50/60Hz	Operation	Aux switch 230VAC SPDT	Motor Open (sec)	Spring Close (sec)	Torque	Damper Area approx	Enclosure IP rating
ER08-230-2	230VAC	2 wire open/close		60	21	8Nm	2m²	IP54
ER08-230-2S	230VAC	2 wire open/close	2 x 5(1.5)A	60	21	8Nm	2m²	IP54
ER08-24-2	24VAC/DC	2 wire open/close		150	22	8Nm	2m²	IP54
ER08-24-2S	24VAC/DC	2 wire open/close	2 x 5(1.5)A	150	22	8Nm	2m²	IP54
ER08-24M	24VAC/DC	0-10VDC/4-20mA		150	22	8Nm	2m²	IP54
ER08-24MS	24VAC/DC	0-10VDC/4-20mA	2 x 5(1.5)A	150	22	8Nm	2m²	IP54
ER20-230-2	230VAC	2 wire open/close		57	15	20Nm	4m²	IP54
ER20-230-2S	230VAC	2 wire open/close	2x5(1.5)A	57	15	20Nm	4m²	IP54
ER20-24-2	24VAC/DC	2 wire open/close		57	15	20Nm	4m²	IP54
ER20-24-2S	24VAC/DC	2 wire open/close	2x5(1.5)A	57	15	20Nm	4m²	IP54
ER20-24M	24VAC/DC	0-10VDC/4-20mA		150	26	20Nm	4m²	IP54
ER20-24MS	24VAC/DC	0-10VDC/4-20mA	2x5(1.5)A	150	26	20Nm	4m²	IP54

DIMENSIONS

ER-08...



ER-20...



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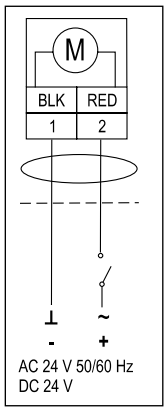
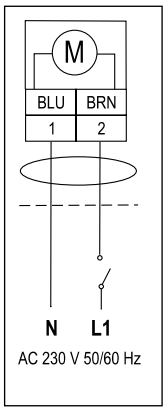
WIRING: Electrical Connections- 1.2m flying lead.

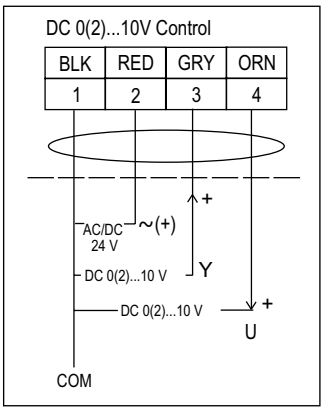
ER-08/ER20-24



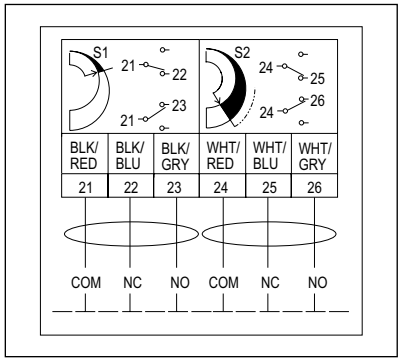
ER08/ER20-230



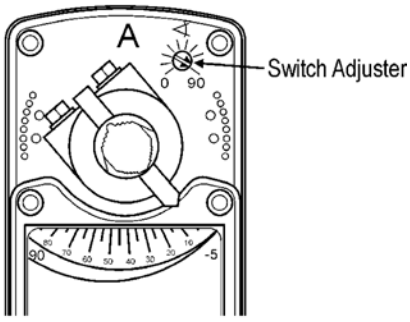
ER08..M/ER20-.../M



Auxiliary switch wiring (if Fitted)

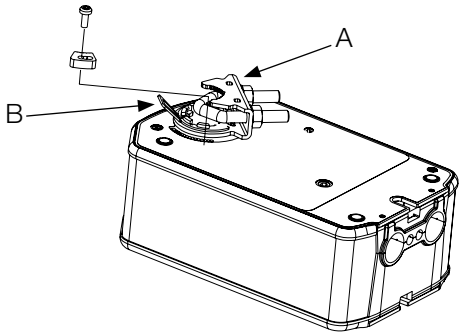


ADJUSTMENTS:



Setting the auxiliary switches

The 10S and 20S models include two integral auxiliary switches with a switch adjuster accessible on either face of the actuator.
The nominal factory setting for auxiliary switch S1 is 11° closing, and the nominal factory setting for auxiliary switch S2 is 81° opening.
The switch point of auxiliary switch S1 is fixed.
The switch point of auxiliary switch S2 is independently and continuously adjustable from 25° to 95°.
The switching position can be manually changed to any required position by turning the ratchet



Direction of rotation

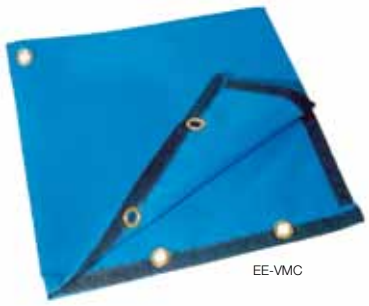
Side A Spring return counter clockwise direction
Side B Clockwise direction

PLEASE NOTE The ER08 and ER20 spring return actuators cannot be fitted to the ER16 linkages. Call Sales for equivalents.

WEATHERPROOF VALVE MOTOR COVER

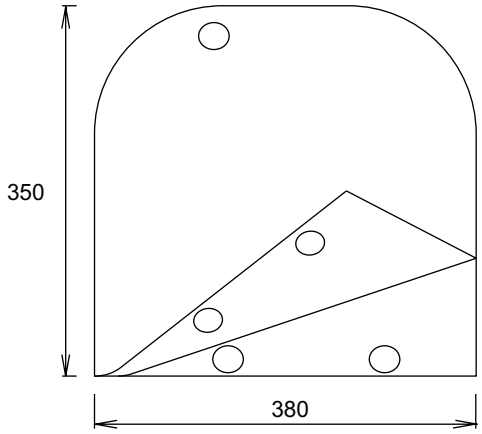
EE-VMC

- Weatherproof cover to protect valve motors against weather conditions.



	Type	Size	Material
EE-VMC	WEATHERPROOF VALVE MOTOR COVER:	350mm x 380mm	PVC Nylon

DIMENSIONS



INSTALLATION:

Fit the cover over the valve motor. Care must be taken to ensure that the cover is adequately sealed to protect from weather conditions. Due to the nature of the fitting and to allow for electrical cables the bottom part of the cover cannot be fully sealed. Therefore the best protection will be provided with the cover opening facing downwards. Use cable ties and sealing tape if necessary.

EE-VMC on damper motor

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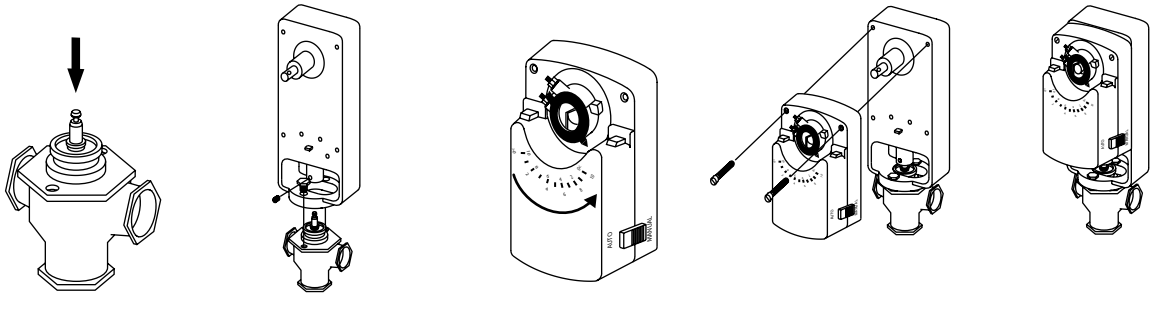
MOUNTING INSTRUCTIONS FOR LINKAGES

EE. . M K / EE..ESB / EE..RD

EE..MK

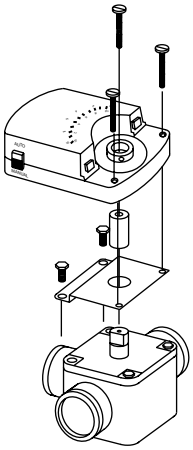


1 **2** **3** **4** **5**

1. Push the valve spindle fully down.
2. Slide the linkage onto the valve spindle. Bolt the linkage onto the valve body and then tighten the spindle screws.
3. Manually rotate the motor anti-clockwise to the closed position.
4. Screw the motor onto the linkage using the 2 screws provided ensuring the valve stem remains fully down.
5. As the motor rotates clockwise the valve spindle should move upwards. Manually operate the motor and ensure that the spindle moves up and down freely.

   For the spring return motor 2 spacers are provided which must be fitted to the linkage, underneath the motor.

EE -1ESB



If fitted, remove the manual handle from the valve shaft.

Rotate the valve shoe to close the required port (the shoe position is indicated by the flat section on the valve shaft.)

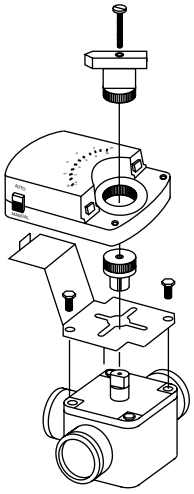
Mount the bracket onto the valve body using the valve bolts or those provided with the linkage.

Fit the coupling over the valve shaft, aligning the flats.

Manually close the motor and fit onto the valve coupling and mounting bracket.

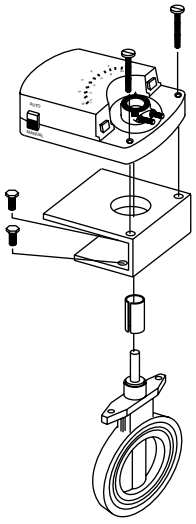
The actuator and mounting bracket can be fitted in any position to rotate the valve shoe between the centre port and either one of the other two ports.

EE-2ESB



If fitted, remove the manual handle from the valve shaft.
Rotate the valve shoe to close the required port (the shoe position is indicated by the flat section on the valve shaft.)
Mount the bracket onto the valve body using the bolts on the valve or those provided with the linkage.
Remove the 'U' bracket assembly from the motor.
Fit the motor coupling over the valve shaft, aligning the flats.
Manually close the motor and fit onto the valve coupling and mounting bracket.
Fit the handle onto the motor aligning the splines and bolt in position to valve stem.
The actuator and mounting bracket can be fitted in any position to rotate the valve shoe between the centre port and either one of the other two ports.

EE-4RD / EE-6RD

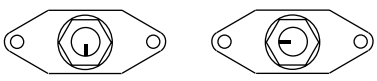


Close the valve by rotating the spindle fully clockwise. The valve is closed when the line on valve stem points in line with the valve body.

Mount the bracket onto the valve body using the bolts provided.

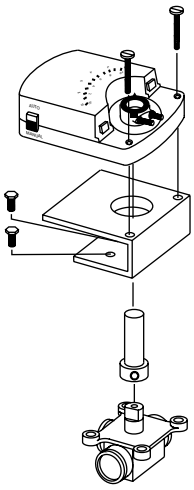
Slide the sleeve onto the valve spindle. DO NOT clamp the motor onto the valve spindle without this sleeve.

Manually close the motor by turning it clockwise and screw it onto the bracket using the screws provided.



Open Closed

EE-4ESB



Fit the mounting bracket onto the valve body with the two M8x10 bolts.
Fit the valve coupling onto the valve spindle aligning the 'D' flat towards the required closed port.
Fit the motor over the valve coupling.
The D flat on the valve spindle indicates the closed port.

To change the direction of rotation remove the 'U' bolt assembly/coupling from the motor by releasing the circlip on the underside and reverse the adaptor sleeve.

Sleeve splines up = clockwise
Sleeve splines down = anticlockwise

The actuator and mounting bracket can be fitted in any position to rotate the valve shoe between the centre port and either one of the other two ports.

VALVES / LINKAGES

BALL VALVES 2 WAY

EB..

These 2 way Ball Valves are suitable for use in heating and air conditioning applications to control the flow of chilled water, hot water and up to 30% glycol in closed circuit systems.
In open circuits ie mains water or cooling, mineral deposits will impair the operation.


EB..

EB..2A to 2H - Body = Brass
EB..FL -Body = Bronze
Ball : Brass Nickel Plated
Ball Gasket : PTFE
Valve Stem Gasket : Rubber EPDM
Rotary travel 90°
Flanged valves to PN16
Full Bore Passage
Tight Shut-off

The motor Part Number must be clearly specified to match each valve ordered.

Supplied complete with mounting bracket for the motor.

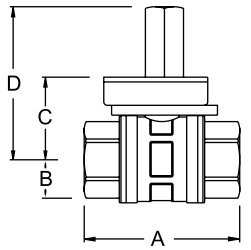
Select motor type E08..E16..E24..E32.. from separate data sheet.

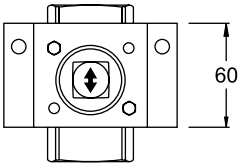
Type	Size		Kvs m³/h	Max Diff Pressure Bar	Max Pressure Bar	Media Temp °C	Select Motor
EB15-2A	15mm	½" BSP Female	16.2	6	16	2 - 110	E08.. ER08..
EB20-2B	20mm	¾" BSP Female	26.5	6	16	2 - 110	E08.. ER08..
EB25-2C	25mm	1" BSP Female	47	6	16	2 - 110	E08.. ER08..
EB32-2D	32mm	1¼" BSP Female	70	6	16	2 - 110	E16.. ER20..
EB40-2E	40mm	1½" BSP Female	145	6	16	2 - 110	E16.. ER20..
EB50-2F	50mm	2" BSP Female	191	6	16	2 - 110	E16.. ER20..
EB65-2G	65mm	2½" BSP Female	340	6	16	2 - 110	E24.. ER20..

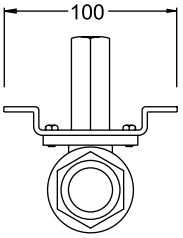
DIMENSIONS

EB..2A..2H

	A	B	C	D
EB15-2A	73	17	31	80
EB20-2B	84	21.5	35.5	84.5
EB25-2C	95	26	40	167
EB32-2D	107	30.5	46.5	107
EB40-2E	119	38.5	58	178
EB50-2F	138	47.5	97.5	142.5
EB65-2G	164	60	93	133
EB80-2H	176	67	100	140





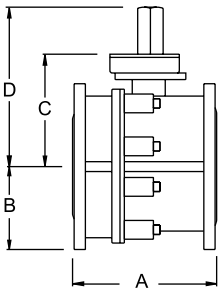


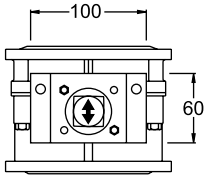
Install the valve with the spindle at any angle vertical to 30° above horizontal.

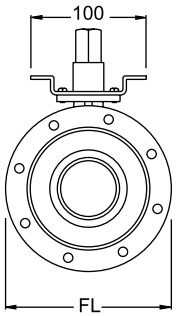
EB.. FL

	A	B	C	D	FL
EB50-2FFL	150	82.5	112.5	152.5	165
EB65-2GFL	170	90.25	120.5	160.5	185
EB80-2HFL	180	100	130	170	200
EB100-2LFL	190	110	140	180	220

Arrow in line with ports = Valve Open





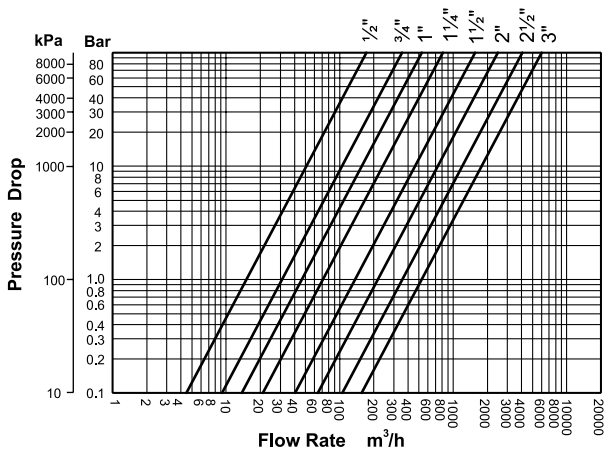


ACCESSORIES:

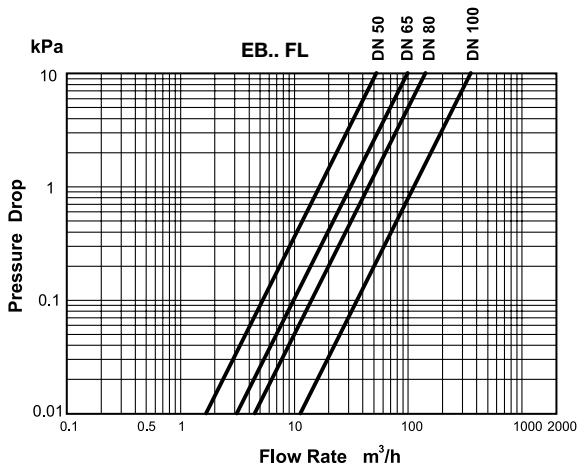
EE-7EB	Linkage Kit with ER-08.. spring return actuator	15 - 32mm
EE-8EB	Linkage Kit with ER-20.. spring return actuator	40 - 100mm

FLOW CHARTS:

EB..2A..2H



EB.. FL



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WATTS®

BALL VALVES 3 WAY

EB..

These 3 way Ball Valves are suitable for use in heating and air conditioning applications to control the flow of chilled water, hot water and up to 30% glycol in closed circuit systems. In open circuits ie mains water or cooling towers, mineral deposits will impair the operation. For diverting applications install in the return pipe only. For mixing applications install in the flow pipe. There must be 2 inlets and 1 outlet stream at all times. Reversal of this will cause vibration and water hammer.

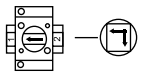
Body : EB..TA..LG = Brass
Body : EB.. FL Flange: Cast Iron
Ball : Brass Nickel Plated
Ball Gasket : PTFE
Valve Stem Gasket : Rubber EPDM
Rotary travel : 90°
Flange valves to PN16
Full Bore Passage
Tight Shut-off

Type		Size	Kvs m³/h	Max Diff Pressure Bar	Max Pressure Bar	Port Position Table	Media Temp °C	Select Motor	
EB15-3TA	15mm	½" BSP Female	13.4	6	16	1	2 - 110	E08..	ER08..
EB20-3TB	20mm	¾" BSP Female	16.5	6	16	1	2 - 110	E08..	ER08..
EB25-3TC	25mm	1" BSP Female	18	6	16	1	2 - 110	E08..	ER08..
EB32-3TD	32mm	1¼" BSP Female	26	6	16	1	2 - 110		ER20..
EB40-3LE	40mm	1½" BSP Female	48.5	6	16	2	2 - 110		ER20..
EB50-3LF	50mm	2" BSP Female	64.5	6	16	2	2 - 110		ER20..

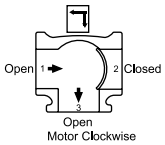
Supplied complete with mounting bracket for the motor.
The motor Part Number must be clearly specified to match each valve ordered.
Select motor type E08..E16..E24..E32.. from separate data sheet.

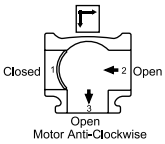
DIMENSIONS

VERTICAL T
Align the motor shaft as shown and fit onto valve spindle.



The arrows on the shaft and spindle just indicate the open ports.





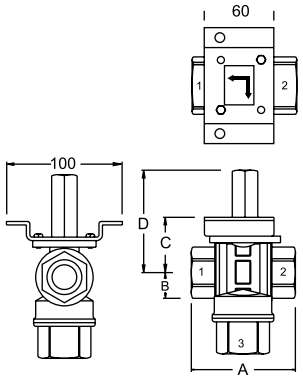
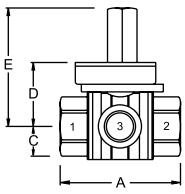


TABLE 1	A	B	C	D
EB15-3TA	73	73	31	80
EB20-3TB	84	87	35.5	84.5
EB25-3TC	95	104	40	167
EB32-3TD	107	115	46.5	178

Install the valve with the spindle at any angle from vertical to 30° above horizontal.



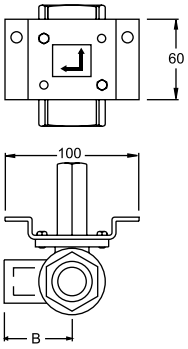


TABLE 2	A	B	C	D	E
EB40-3LE	119	60	39	58	107
EB50-3LF	138	71.5	47.5	148	197
EB65-3LG	164	89	60	94	210

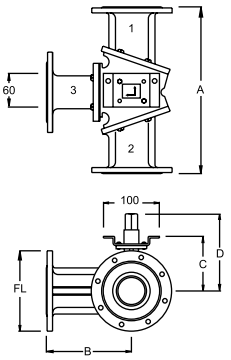
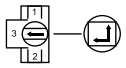
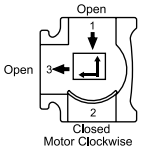


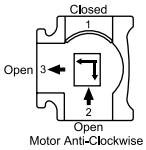
TABLE 3	A	B	C	D	FL
EB50-3FFL	320	160	112.5	152.5	165
EB65-3GFL	350	175	120.5	160.5	185
EB80-3HFL	390	195	130	170	200
EB100-3LFL	430	215	140	180	220

HORIZONTAL T
Align the motor shaft as shown and fit onto valve spindle.



The arrows on the shaft and spindle just indicate the open ports.



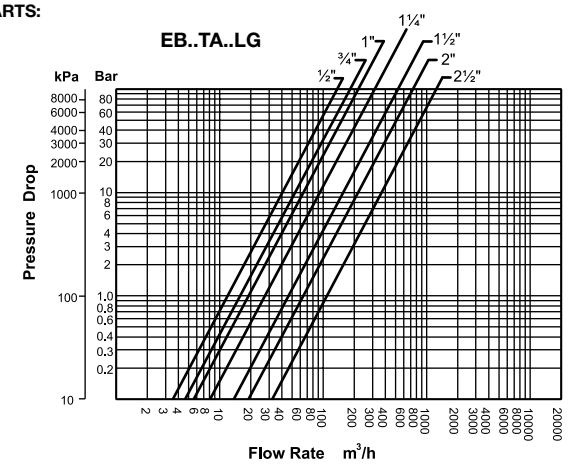


ACCESSORIES:

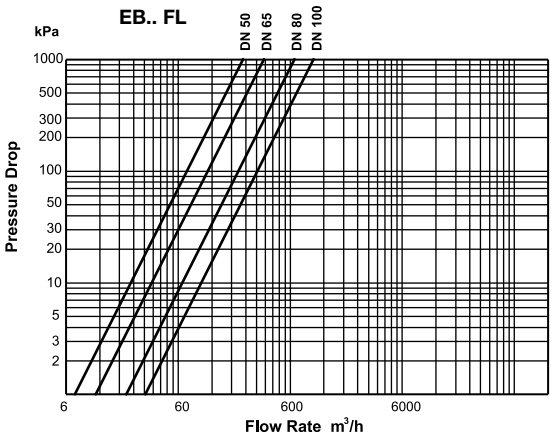
EE-7EB	Linkage Kit with ER-08.. spring return actuator	15 - 32mm
EE-8EB	Linkage Kit with ER-20.. spring return actuator	40 - 65mm

FLOW CHARTS:

EB..TA..LG



EB.. FL



VALVES / LINKAGES

LIFT & LAY / SEAT VALVES 2 & 3 WAY

MK.. MKDN..

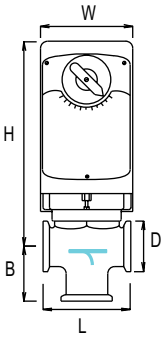
These mixing valves are suitable for diverting or mixing applications in closed hot water, chilled water & up to 30% glycol systems. In open circuits, ie mains water or cooling towers, mineral deposits will impair the operation. For diverting applications the valve must be installed in the return pipe only. For mixing or diverting there must be 2 inlets and 1 outlet stream. Reversal of these will cause vibration & water hammer.

- Stainless steel spindle
- Flanged valves to PN16
- Rangeability 30:1
- Media temp. 2°C to 110°C
- Tight Shut off
- Max. pressure 16 Bar
- Equal percentage flow characteristic
- Leakage 0.1% Kvs

Type	Size			Max Diff Pressure Bar	Kvs m³/h	Lift Height mm	Valve Body Material	Select Motor Spring Rtn	
MK15	15mm	½"	BSP	10	3	15	Brass	E08..	ER08..
MK20	20mm	¾"	BSP	10	6	15	Brass	E08..	ER08..
MK25	25mm	1"	BSP	10	9	15	Brass	E08..	ER08..
MK32	32mm	1¼"	BSP	6.5	14	15	Brass	E08..	ER08..
MK40	40mm	1½"	BSP	3.5	19	15	Brass	E08..	ER08..
MK50	50mm	2"	BSP	2.5	25	15	Brass	E08..	ER08..
MKDN50	50mm	2"	Flanged	3.5	40	16	Cast Iron	E16..	ER20..
MKDN65	65mm	2½"	Flanged	2	63	30	Cast Iron	E16..	ER20..
MKDN80	80mm	3"	Flanged	1	100	30	Cast Iron	E16..	ER20..
MKDN100	100mm	4"	Flanged	0.8	160	30	Cast Iron	E16..	ER20..

ORDER VALVE + LINKAGE + MOTOR **SEE SEPARATE DATA SHEET TO SELECT MOTOR.**

DIMENSIONS



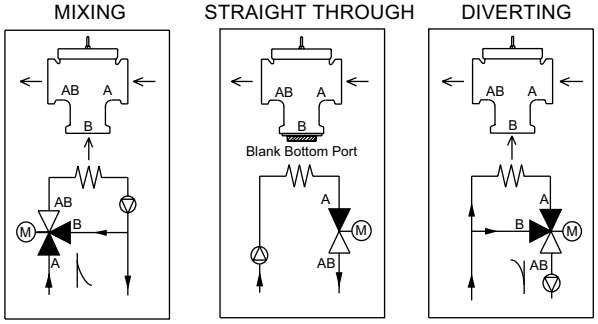
VALUE	SIZE	W	L	B	H	D
MK15	½"	102	80	55	289	
MK20	¾"	102	80	55	289	
MK25	1"	102	90	60	289	
MK32	1¼"	102	110	65	289	
MK40	1½"	102	110	65	289	
MK50	2"	102	150	85	294	
MKDN50	50mm	102	230	100	309	165
MKDN65	65mm	102	291	120	344	185
MKDN80	80mm	102	312	130	354	200
MKDN100	10mm	102	350	150	400	220

ACCESSORIES:

EE-2MK	Linkage Kit for MK15 to MK50 screwed valves	Suitable for use with	E08.. E16..	motors ONLY
EE-3MK	Linkage Kit for MKDN50 flanged valve	Suitable for use with	E16..	motors ONLY
EE-4MK	Linkage Kit for MKDN65, MKDN80, MKDN100 flanged valves	Suitable for use with	E16..	motors ONLY
EE-10MK	Linkage Kit for MK15 to MK50 screwed valves	For Spring Return	ER08	motors ONLY
EE-11MK	Linkage Kit for MKDN50 flanged valves	For Spring Return	ER20	motors ONLY
EE-12MK	Linkage Kit for MKDN65, MKDN80 flanged valves	For Spring Return	ER20	motors ONLY

EXAMPLES:

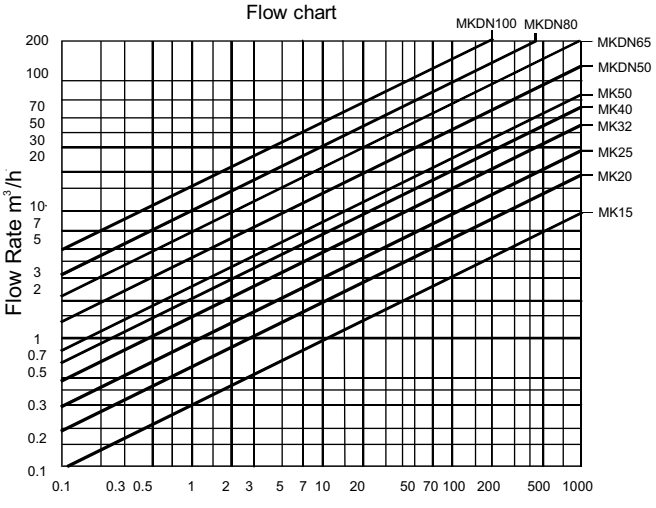
TYPICAL APPLICATIONS



VALVE
Valve stem UP B to AB open
Valve stem DOWN A to AB open

For 2 port valves the bottom port must be blanked - Reduce ΔP
Install the valve with the spindle at any angle vertical to 30° above horizontal.

Flow chart



Pressure Drop ΔP kPa

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ROTARY VALVES 2 & 3 WAY

AB.. AC.. F..

- A range of rotary valves 15mm to 150mm suitable for diverting or mixing water in closed circuit heating applications.

Media temperature 5°C to 110°C
In open circuits ie mains water, cooling towers etc. mineral deposits will impair the operation.

The position of the shoe is always opposite the flat on the spindle.

F.. valves flanged to PN6

Material :
3AB.. Brass
3AC.. & F.. Cast Iron body, Brass shoe, Stainless Steel spindle.

The valve can be installed with the spindle at any angle vertical to 30° above the horizontal plane.
All leakage rates are measured at a differential pressure of 0.5 Bar.

Type	Size			Kvs m³/h	Leakage % Kvs Mixing	Diverting	Max Static Pressure	4Nm	Select Motor	Spring Return
3AB15-25	15mm	½"	BSP	2.5	<0.2%	<0.2%	10 Bar	EK4..	E08..	ER08..
3AB20-4	20mm	¾"	BSP	4	<0.2%	<0.2%	10 Bar	EK4..	E08..	ER08..
3AB20-63	20mm	¾"	BSP	6.3	<0.2%	<0.2%	10 Bar		E08..	ER08..
3AB25-8	25mm	1"	BSP	8	<0.2%	<0.2%	10 Bar		E08..	ER08..
3AB25-12	25mm	1"	BSP	12	<0.2%	<0.2%	10 Bar		E08..	ER08..
3AB32-15	32mm	1¼"	BSP	15	<0.2%	<0.2%	10 Bar		E08..	ER08..
3AC20	20mm	¾"	BSP	8	<1%	<0.5%	10 Bar		E08..	ER08..
3AC25	25mm	1"	BSP	12	<1%	<0.5%	10 Bar		E08..	ER08..
3AC32	32mm	1¼"	BSP	18	<1%	<0.5%	10 Bar		E08..	ER08..
3AC40	40mm	1½"	BSP	24	<1%	<0.5%	10 Bar		E16..	ER20..
3AC50	50mm	2"	BSP	40	<1%	<0.5%	10 Bar		E16..	ER20..
3F50	50mm	2"	Flanged	60	<1%	<0.5%	6 Bar	EK4..	E16..	ER20..
3F65	65mm	2½"	Flanged	90	<1%	<0.5%	6 Bar		E16..	ER20..
3F80	80mm	3"	Flanged	150	<1%	<0.5%	6 Bar		E16..	ER20..
3F100	100mm	4"	Flanged	225	<1%	<0.5%	6 Bar		E16..	ER20..
3F125	125mm	5"	Flanged	280	<1%	<0.5%	6 Bar		E16..	ER20..
3F150	150mm	6"	Flanged	400	<1%	<0.5%	6 Bar		E16..	ER20..

ORDER VALVE + LINKAGE + MOTOR - SEE DATA SHEET ON MOTORS.
On 3AB.. and 3AC.. for 360° rotation remove the red disc under the knob

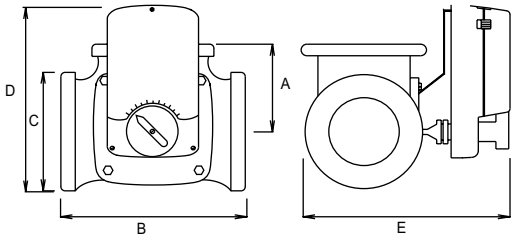
For 2 ports – blank the middle port - reduce ΔP

DIMENSIONS

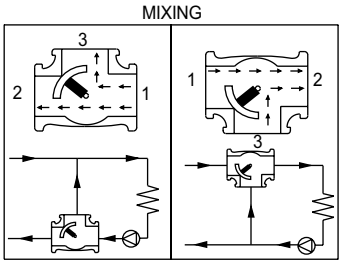
VALVE	A	B	D	E
3AB15-25	40	80	170	140
3AB20-4	40	80	170	140
3AB20-63	40	80	170	140
3AB25-8	41	82	172	143
3AB25-12	41	82	172	143
3AB32-18	42	84	175	144

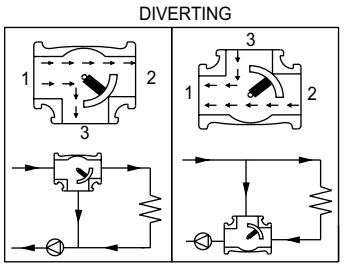
VALVE	A	B	D	E
3AC20	56	112	186	183
3AC25	56	112	187	183
3AC32	63.5	127	187	183
3AC40	63.5	127	187	183
3AC50	63.5	127	187	211

VALVE	A	B	C	D	E
3F50	97.5	195	140	215	236
3F65	100	200	160	225	246
3F80	120	240	190	235	273
3F100	132.5	265	210	245	295
3F125	150	300	240	275	316
3F150	175	350	265	305	337



Dimensions D & E are for E08.. E16.. motors only
D & E will be less for EK4.. & more for ER16..
On 3AB.. and 3AC.. for 360° rotation remove the red disc under the knob





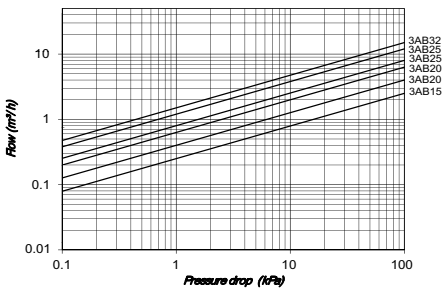
The motor can operate between ports 3-2 or 3-1

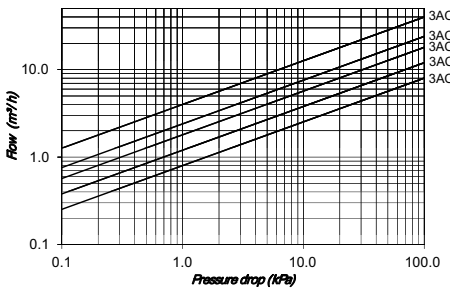
ACCESSORIES:

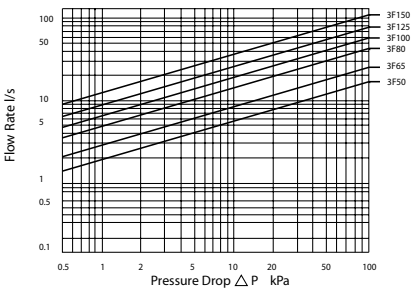
EE-2MB Linkage for Satchwell MB valve - use E08..& E16.. motors ONLY
EE-2MBF Linkage for Satchwell MBF valve - use E16.. motors ONLY

EE-1ESB Linkage Kit - use EK4.. motors ONLY
EE-2ESB Linkage Kit - use E08..& E16.. motors ONLY
EE-5ESB Linkage Kit - use ER08.. motors ONLY
EE-6ESB Linkage Kit - use ER20.. motors ONLY

FLOW CHARTS:







VALVES / LINKAGES

BUTTERFLY VALVES

RD..

These ring butterfly valves are used to control liquid flow in closed circuit heating systems. RD.. valves have a small leakage rate and are suitable for normal hot water boiler applications. RDP.. valves have tight shut-off characteristics (see below) and are suitable for hot water, chilled water and up to 30% glycol systems. In open circuits ie mains water, cooling towers, mineral deposits will impair the operation.

RD..

Materials: Cast Iron Body, Brass disc, Stainless Steel spindle, Graphite asbestos packing gland.

Media temp. 2°C - 110°C

The RDP.. valves have a PTFE lining providing tight shut-off and allowing standard actuators to be used.

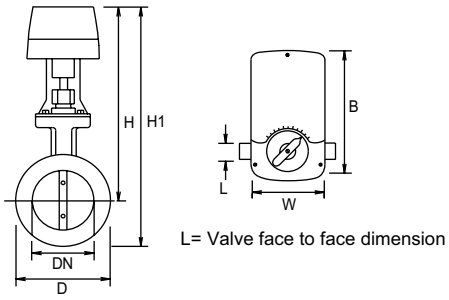
LARGER SIZES AVAILABLE ON REQUEST

Type	Size mm	Max Diff Press Bar	Kvs m³/h	Leakage %Kvs	Max Static Press Bar	Select Motor 8Nm	Select Motor 16Nm	Spring Return
RD25	25	8	12	0.5	16	E08..		ER08..
RD32	32	8	20	0.5	16	E08..		ER08..
RD40	40	8	47	0.5	16	E08..		ER08..
RD50	50	5	85	0.5	16		E16..	ER20..
RD65	65	3	165	0.5	16		E16..	ER20..
RD80	80	2	250	0.5	16		E16..	ER20..
RD100	100	1.5	435	0.5	16		E16..	ER20..
RD125	125	1.2	745	0.5	16		E16..	ER20..
RD150	150	1	1350	0.5	16		E16..	ER20..
RDP-25	25	8	12	**0.05**	16	E08..		ER08..
RDP-32	32	8	20	**0.05**	16	E08..		ER08..
RDP-40	40	8	62	**0.05**	16	E08..		ER08..
RDP-50	50	5	115	**0.05**	16		E16..	ER20..
RDP-65	65	3	185	**0.05**	16		E16..	ER20..
RDP-80	80	2	290	**0.05**	16		E16..	ER20..
RDP-100	100	1.2	480	**0.05**	16		E16..	ER20..
RDP-125	125	1	785	**0.05**	16		E16..	ER20..
RDP-150	150	0.8	1400	**0.05**	16		E16..	ER20..
RDP-200	200	0.3	2400	**0.05**	16		E24.. 24Nm motor only.	

SELECT VALVE + LINKAGE + MOTOR **SEE SEPARATE DATA SHEET TO SELECT MOTOR.**

DIMENSIONS

Fit valve between mating flanges for pressure ratings required between PN6 to PN16



L= Valve face to face dimension

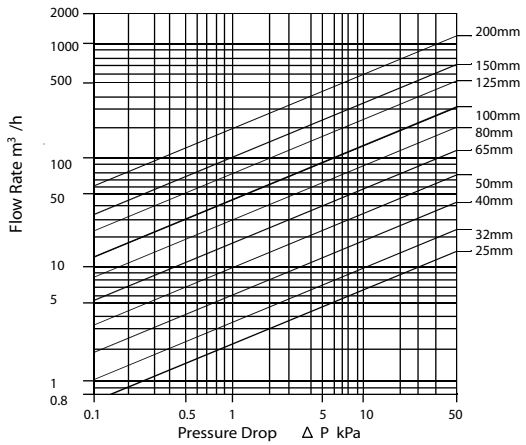
VALVE SIZE	DN	D	H	H1	W	L	B1	B2
25mm	31	64	176	215	102	30	180	250
32mm	37	76	187	232	102	30	180	250
40mm	40	86	192	242	102	30	180	250
50mm	50	97	202	256	102	35	180	250
65mm	65	118	208	272	102	35	180	250
80mm	80	132	218	288	102	40	180	250
100mm	100	150	228	310	102	40	180	250
125mm	125	182	242	339	102	45	180	250
150mm	150	206	262	372	102	45	180	250
200mm	200	260	324	458	102	50	180	250

B1 when using E08.. E16.. E24.. B2 When using ER16..

ACCESSORIES:

EE-4RD	Linkage Kit for RD valves 25--150mm	Suitable for use with E08.. and E16.. motors ONLY
EE-7RD	Linkage Kit for RD 200mm valves.	Suitable for use with E24.. motors ONLY
EE-8RD	Linkage Kit for RD valves 25-40mm	Suitable for use with ER08.. spring return motors ONLY
EE-9RD	Linkage Kit for RD valves 50-150mm	Suitable for use with ER20.. spring return motors ONLY

EXAMPLES:



Typical Application

For use in low pressure hot water (LPHW) heating systems to prevent water flow through unfired boilers in a multi-boiler installation.
RD.. valves can also be used as zone valves where slight leakage in the closed position is acceptable.
RDP.. valves can be used on applications which require shut off ie. hot water, chilled water and up to 30% glycol systems.

Operation

When installed in a boiler return pipeline and the system requires the boiler to operate, a control signal/changeover contact can be used to motor open the valve and allow water to flow through the boiler.
The burner can then operate under the control of the boiler thermostat.
A motor with auxiliary switches can be used to ensure that the valve is open before the burner operates.

Installation: Install the valve with the spindle at any angle from vertical to 30 degrees above the horizontal plane.

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WATTS®

MOTORISED SPRING RETURN VALVES 2 & 3 PORT

EZV..

- 2 & 3 port spring return valves for zoning & diverting in closed circuit hot water, chilled water & up to 30% glycol systems.
Supplied complete with motors.

ORDER AUXILIARY SWITCH SEPARATELY

Media temp. 4°C to 110°C

Max. pressure 10 Bar

Consumption 5W

Max ambient 60°C

Materials: brass body, rubber ball/plug for 100% shut off.

Wiring cable 0.5m

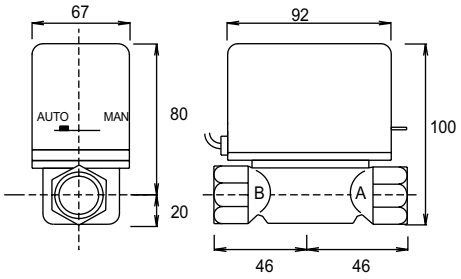
Auto/Manual lever

Replaceable motor

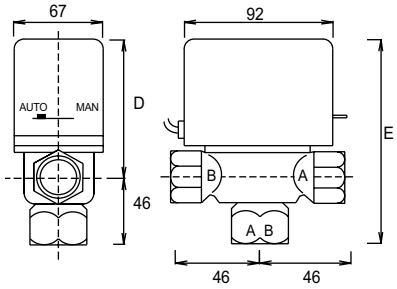
Type	Connection	Max Diff Press Bar	Kvs m³/h	Supply ±10%	Motor Open	Spring Close	Application	Enclosure
EZV-211	½" BSP	0.90	6.0	230VAC	10s	4s	Zone	IP20
EZV-212	15mm comp.	0.90	6.0	230VAC	10s	4s	Zone	IP20
EZV-213	¾" BSP	0.90	7.0	230VAC	10s	4s	Zone	IP20
EZV-214	22mm comp.	0.90	7.0	230VAC	10s	4s	Zone	IP20
EZV-215	1" BSP	0.90	9.0	230VAC	10s	4s	Zone	IP20
EZV-216	28mm comp.	0.90	9.0	230VAC	10s	4s	Zone	IP20
EZV-311	½" BSP	1.54	6.6	230VAC	20s	6s	Diverting	IP20
EZV-312	15mm comp.	1.54	6.6	230VAC	20s	6s	Diverting	IP20
EZV-313	¾" BSP	1.54	7.8	230VAC	20s	6s	Diverting	IP20
EZV-314	22mm comp.	1.54	7.8	230VAC	20s	6s	Diverting	IP20
EZV-315	1" BSP	0.62	12.6	230VAC	20s	6s	Diverting	IP20
EZV-316	28mm comp.	0.62	12.6	230VAC	20s	6s	Diverting	IP20
EZV-M1	Auxiliary switch for EZV..	230VAC 3(1)A SPST		The volt free contact closes when the valve is fully open				

DIMENSIONS

EZV-2..



EZV-3..

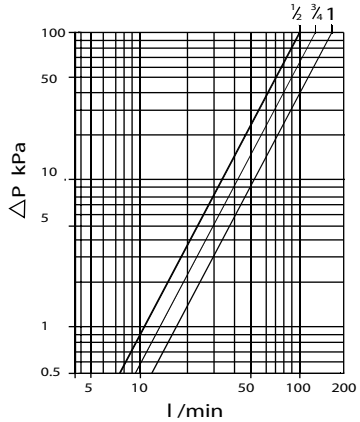


Install the valve with the motor at any angle vertical to 30° above the horizontal plane.

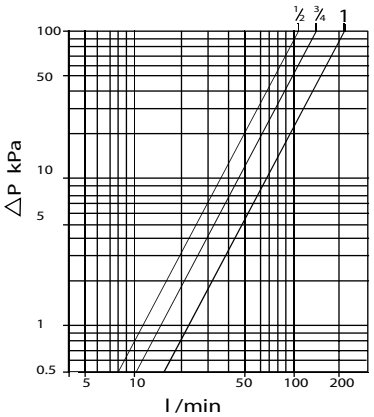
Type	D	E
EZV-311,312,313,314	79	125
EZV-315,316	84	130

FLOW CHARTS:

EZV-2..

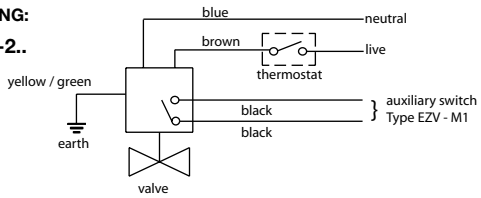


EZV-3..

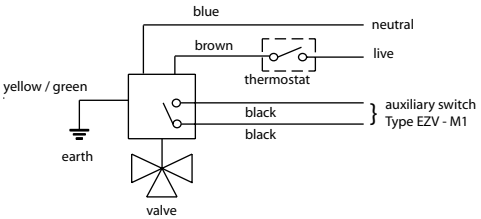


WIRING:

EZV-2..

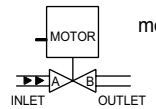


EZV-3..

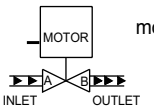


EXAMPLES:

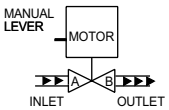
EZV-2..



motor off

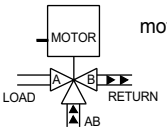


motor on (auto)

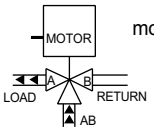


motor off manual lever locked open

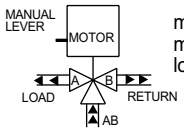
EZV-3..



motor off



motor on (auto)



motor off manual lever locked open

GENERAL ORDER INFORMATION

HOW TO ORDER

BY PHONE Monday to Thursday 8.30 to 16.45, Friday 8.30 to 16.15. Orders for delivery the following day must be placed before 15.00. After this time please call us. Please confirm all verbal orders in writing marked "confirmation order".

BY FAX Any time on +44(0)1480 407076. Please specify product , quantity, description, delivery and invoice address, order numbers and delivery method.

BY EMAIL Send to sales@electrocontrols.co.uk

TECHNICAL INFORMATION

For further information on listed products do not hesitate to call us on +44(0)1480 407074.We can supply technical data sheets where available or offer technical assistance with your application.

RETURNED GOODS

Returned goods will only be accepted if faulty and when accompanied by complete documentation.
A minimum restocking charge of 25% will be made for returned goods which are found not to be faulty.
All returns must be agreed in advance.

CONDITIONS OF SUPPLY

PRICES

Prices shown exclude VAT. The prices are subject to change with appropriate notice.

TERMS

See Terms and Conditions at the back of the catalogue.

MINIMUM ORDER VALUE

The minimum order value is £50 net order value unless agreed in writing in advance.

DELIVERY CHARGE

Unless agreed in writing in advance the fixed delivery charges will be:

£13.50 for 1 to 2 day delivery in England, Scotland and Wales.

£25.50 for next weekday delivery before 10.00 in England, Scotland and Wales.

£16.50 for 1 to 2 day delivery in N.Ireland.

Deliveries to Southern Ireland by quotation.

Overseas deliveries by quotation.

DISCOUNTS

For general business discounts are by written agreement.

For large quantity orders we will be pleased to quote special discounts for a specific order.

SAFETY PRECAUTIONS

Make sure you have selected the correct input voltage for the product before installation.

The product wiring should be checked by a qualified technician before applying voltage to it.

Observe all applicable safety precautions and wiring and earthing regulations.

Isolate the product from the mains before removing any covers.

Observe any special requirements for cabling, screened cable, for example.

If failure of a fuse occurs determine the reason for failure before replacing it with a new one of the correct type and current rating.

After installation ensure that the product works correctly. If failure of the device can cause damage a safety back up control should be fitted.

Under no circumstances use a product for a purpose other than that defined in the catalogue. If in doubt consult the factory.

Retain the product data sheets for future use.

Product data given is for guidance purposes only and is subject to change without prior notice. Its accuracy is not guaranteed unless confirmed by us in writing.

NOTES

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