



Basic



Downstream

D2

## Copperad Unit Heaters

(November 2005 onwards)

### Installation, Operation and Maintenance Instructions

To be retained by the user

**Copperad®**

**QA/IOM/66 Issue 1**

## 1 GENERAL

### 1.1 GENERAL DESCRIPTION

This manual covers the Copperad Unit Heater range. These are fully assembled units intended for either vertical or, with diffusers, horizontal mounting. The styles available are basic (with a wire guard to the motor), with an enclosure, or with style D2 diffusers.

### 1.2 RECEIPT AND PREPARATION

The units are wrapped and display the serial number, model reference, site reference (where appropriate). Installation, operation and maintenance instructions, together with wiring and any special instructions are all supplied with the unit. On receipt, check that all details are correct to the Customer Schedules prior to opening packaging. Damage should be reported to the supplying B S S branch immediately. It is recommended that packaging is kept in place and the units stored in a safe area until the necessary services are completed, in order to avoid the possibility of damage on site.

## 2.0 INSTALLATION

**2.1** The Copperad unit heater is packed fully assembled, apart from the suspension cleats which are stowed on the unit as follows :-

Basic, guarded and downstream D1—screwed to the back of the fan shroud.

Downstream D2—screwed in to the heat exchanger face recess

**2.2** Remove the cleats from their stowed position and fix to the casing at the positions indicated by the circular labels, with the screws and washers supplied. These positions are on the top face for the basic, guarded and enclosed styles, and on two opposite sides for the downstream styles.

**2.3** When a separate capacitor is supplied for the motor it is stowed adjacent to the motor. Remove the capacitor and mount in a safe, cool place remote from the unit heater. Wire to the motor as shown in the wiring diagram supplied. Note that any starters, etc supplied with unit will be packaged separately.

**2.4** Suspend the unit from the roof structure by means of suitable hanger rods to the cleats and pipe up to the connections provided. Note that to achieve the optimum performance from two or three row water heat exchangers, the flow should enter at the connection nearest to the air outlet on all styles, i.e the water should always enter at the lowest point to ensure any entrapped air is vented from the heat exchanger.

When used on steam systems, these units must be suitably trapped to obtain maximum output. It is also advisable to provide a steam strainer and dirt pocket.

**2.5** The louvres fitted to basic, guarded, enclosed and downstream D1 styles are self locking—there are no screws and they can be adjusted merely by grasping with both hands and moving to the desired position. There is a top and bottom limit stop.

**2.6** The vanes fitted to the downstream D2 style are also self locking. These can be adjusted by grasping with both hands and moving to the desired position. The vanes can be adjusted between completely vertical and as near horizontal as possible. The vanes should be set vertically for very high mounting heights and nearly horizontal for very low mounting heights.

## 3.0 MAINTENANCE

**3.1 CLEANING** In order to maintain the Copperad unit heater at maximum efficiency, it is recommended, especially where the unit is installed in a particularly dusty environment, that the heat exchanger should be cleaned by directing a blast of compressed air or steam through it, at least once every six months.

**3.2 LUBRICATION** As standard, the motors fitted to the Copperad unit heaters are of the sealed for life type, and lubrication is neither necessary nor possible.

**3.3 DRAIN DOWN** It is recommended that all Copperad unit heaters operating on steam should be thoroughly drained at the end of each heating season to ensure that no condensate is left in the heat exchanger. Should there be any possibility of non-operation of the heating system during severe weather, the entire system should be drained with a view to preventing damage by frost.

#### 4.0 MOTOR REPLACEMENT

Should the motor fail to operate for any reason other than the failure of the electric supply or fuses, remove the motor from its mounting, after removing the mounting arms screws from the captive nuts in the fan plate, remove the fan from the shaft, taking care not to damage the fan blades or the motor bearings and return the motor to the supplying BSS branch, who will instigate the necessary actions under warranty, where applicable, or replace the motor from stock on a chargeable basis if not covered by warranty.

Under no circumstances should the motor be interfered with, since this will automatically invalidate any remaining warranty which may be applicable to the unit. At the time of removal of the fan, observe carefully which way round it is mounted on the shaft, and be sure to replace it in the same position. As a check, the concave side of the blades must face the heat exchanger in the case of basic, guarded, enclosed and downstream D1 units, and the convex side must face the heat exchanger in the case of downstream D2 units.

When replacing the motor, care must be taken to see that the black line marked on the fan blade tip is in line with either :-

The edge of the flange on the fan shroud plate for basic, guarded, enclosed and downstream D1 styles or

The face of the fan shroud plate for downstream D2 styles. Note that the arrow marked on the blade indicates the direction of rotation.

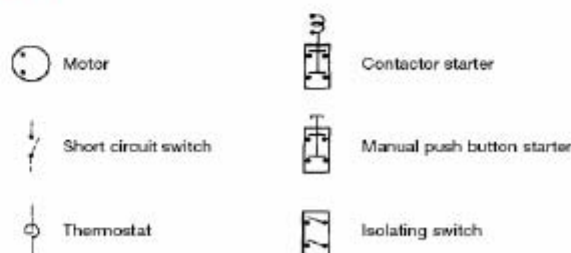
Ensure that the circlip is replaced on to the end of the shaft.

## Electrical Data & Wiring

Unit Size	Rev/min	1 Phase Supply (240V) Current (amp)		3 Phase Supply (415V) Current (amp)	
		Full Load	Starting	Full Load	Starting
A4	1400	1.00	4.5	0.4	2.3
A9	940	0.34	0.62	0.46	1.5
A7	700	0.22	0.45	0.46	1.3
B4	1400	1.4	4.5	0.52	2.3
B9	940	0.44	0.62	0.46	1.5
B7	700	0.26	0.45	0.45	1.3
C4	1400	1.3	4.5	0.50	2.3
C9	940	0.4	0.62	0.46	1.5
C7	700	0.25	0.45	0.45	1.3
D4	1400	1.05	5.8	1.9	11.2
D9	940	1.2	2.5	0.62	1.5
D7	700	1.2	2.4	0.55	1.3
E4	1400	3.3	11.8	1.8	11.2
E9	940	1.1	2.5	0.60	1.5
E7	700	1.1	2.4	0.50	1.3
F9	940	2.75	6.0	1.00	4.1
F7	700	1.2	2.4	0.62	1.3

1. These currents are for the standard range of motors only.
2. The starting current is with locked rotor
3. Actual motor power ratings can be supplied on request in connection with any specific order.

### Key

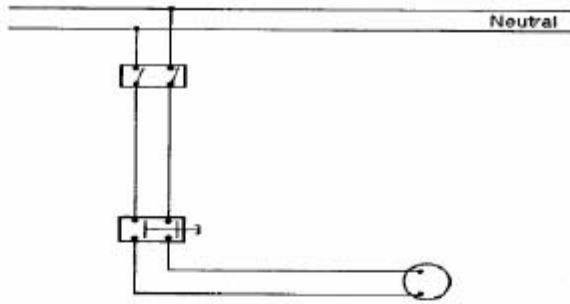


Starter or coil when fitted between phases is indicated thus:-

and when fitted between phase and neutral is indicated thus:-

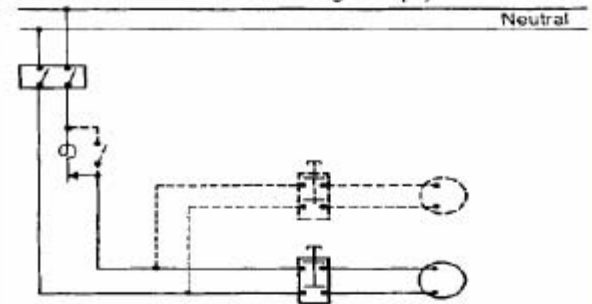
### A: Single phase and DC

Hand control, single unit.



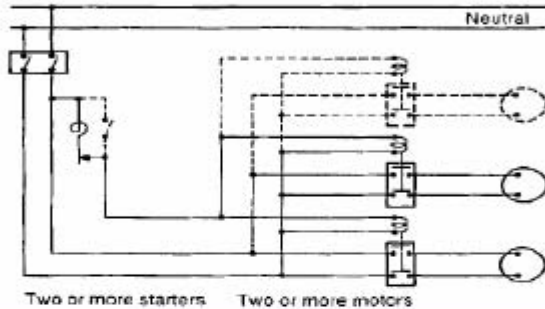
### B: Single phase

Thermostat control for one or two motors without contactor (full load line current not exceeding 3 amps).



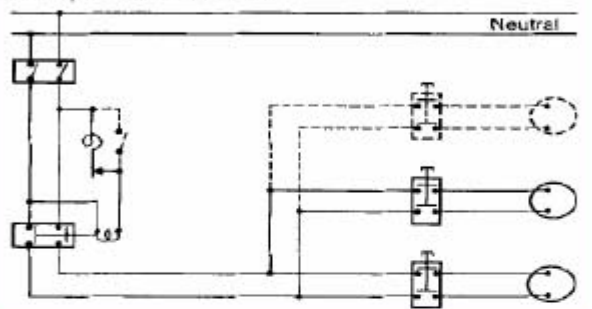
### C: Single phase and DC

Thermostat control for multiple motors with connector type starter.



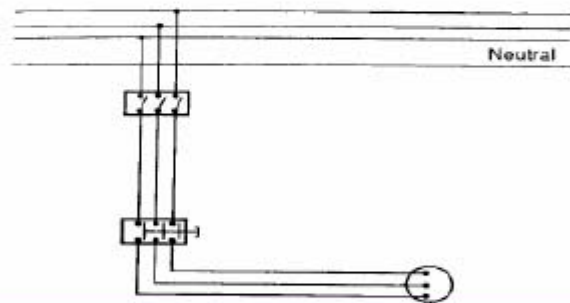
### D: Single phase

Thermostat control for multiple motors with contactor and manual push-button starter.



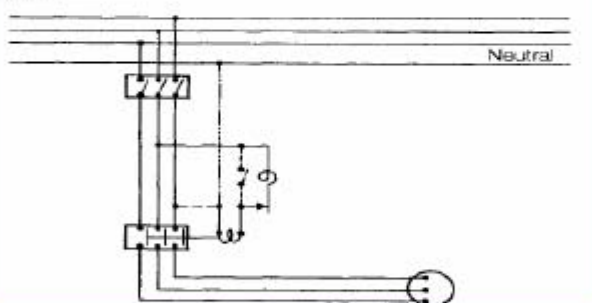
### E: 3 Phase

Hand control, single unit.



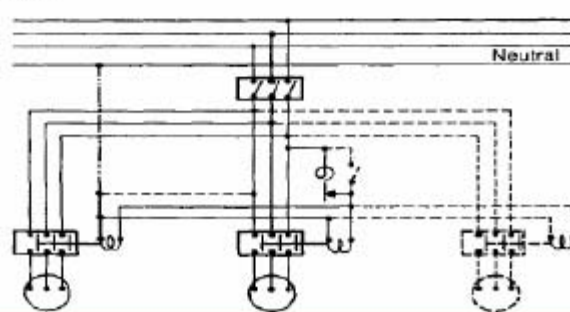
### F: 3 Phase

Thermostat control for single unit with contractor type starter.



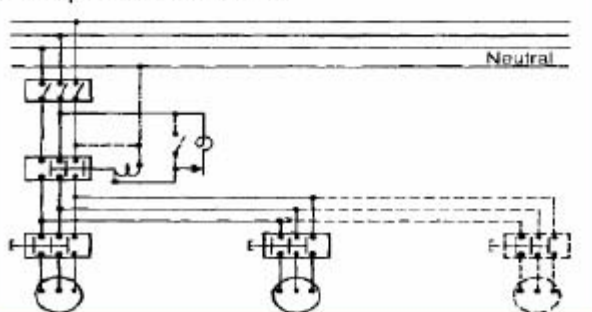
### G: 3 Phase

Thermostat control for multiple motors with contactor type starter.



### H: 3 Phase

Thermostat control for multiple motors with contactor and manual push-button starters.





# Weights, Water Content and Shipping Space

Model Ref.	BASIC & D1				ENCLOSED				D2				ALL TYPES	
	Net Weight		Shipping Space		Net Weight		Shipping Space		Net Weight		Shipping Space		Net Weight	
	kg	lb	m³	ft³	kg	lb	m³	ft³	Kg	lb	m³	ft³	kg	lb
A1	30	65	.23	8	34	75	.23	8	34	75	.28	10	0.7	1.9
A2	32	70	.23	8	37	80	.23	8	37	80	.28	10	1.2	2.7
AW1	30	65	.23	8	34	75	.23	8	34	75	.28	10	0.7	1.9
AW2	32	70	.23	8	37	80	.23	8	37	80	.28	10	1.2	2.7
AW3	34	75	.23	8	39	85	.23	8	39	85	.28	10	1.4	3.1
B1	34	75	.28	10	41	90	.28	10	41	90	.34	12	1.1	2.4
B2	37	80	.28	10	43	95	.28	10	43	95	.34	12	1.5	3.3
BW1	34	75	.28	10	41	90	.28	10	41	90	.34	12	1.1	2.4
BW2	37	80	.28	10	43	95	.28	10	43	95	.34	12	1.5	3.3
BW3	39	85	.28	10	46	100	.28	10	46	100	.34	12	1.9	4.2
C1	39	85	.34	12	46	100	.34	12	48	105	.42	15	1.4	3.0
C2	43	95	.34	12	50	110	.34	12	53	115	.42	15	1.9	4.2
CW1	39	85	.34	12	46	100	.34	12	48	105	.42	15	1.4	3.0
CW2	43	95	.34	12	50	110	.34	12	53	115	.42	15	1.9	4.2
CW3	48	105	.34	12	55	120	.34	12	57	125	.42	15	2.5	5.6
D1	48	105	.40	14	57	125	.40	14	60	130	.51	18	2.1	4.7
D2	53	115	.40	14	62	135	.40	14	64	140	.51	18	3.0	6.6
DW1	48	105	.40	14	57	125	.40	14	60	130	.51	18	2.1	4.7
DW2	53	115	.40	14	62	135	.40	14	64	140	.51	18	3.0	6.6
DW3	60	130	.40	14	68	150	.40	14	71	155	.51	18	3.8	8.4
E1	55	120	.57	20	64	140	.57	20	68	150	.62	22	2.6	5.7
E2	62	135	.57	20	71	155	.57	20	75	165	.62	22	3.8	8.4
EW1	55	120	.57	20	64	140	.57	20	68	150	.62	22	2.6	5.7
EW2	62	135	.57	20	71	155	.57	20	75	165	.62	22	3.8	8.4
EW3	71	155	.57	20	79	175	.57	20	82	185	.62	22	5.1	11.2
F1	66	145	.68	24	75	165	.68	24	79	175	.79	28	3.2	7.1
F2	75	165	.68	24	82	185	.68	24	88	195	.79	28	4.8	10.7
FW1	66	145	.68	24	75	165	.68	24	79	175	.79	28	3.2	7.1
FW2	75	165	.68	24	82	185	.68	24	88	195	.79	28	4.8	10.7
FW3	82	185	.68	24	95	210	.68	24	100	220	.79	28	6.4	14.2

## Notes

Packed weight is net weight plus 50 per cent approximately.  
 Net weights apply to units fitted with standard totally enclosed motors.

# Copperad®

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