

Heat Treatment Consumables and Spares Cooperheat



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Introduction:

Cooperheat has a long standing reputation for design and engineering excellence the world over, bringing its expertise and over 50 years experience in heat treatment equipment to customers on a global scale.

Cooperheat first developed the ceramic heating element in 1958, and continues to design, manufacture and supply a comprehensive range of heat treatment equipment which is renowned for its quality, safety, durability and reliability.

Cooperheat's range of heat treatment equipment includes necessary power control units, temperature recorders, temperature control instruments, cables, heating elements, insulation, accessories and spares.

Cooperheat equipment is designed and manufactured by experienced, qualified engineers and technicians. Each item is inspected and certified by our quality control in accordance with our ISO 9001 : 2008 quality management system and the European Safety Directives.

Cooperheat's sales engineers are dedicated to providing you with the very best in service and customer care.

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Spare Advantage 3 programmer/controller

Replacement 'Advantage 3' linkable, programmer/controller. Supersedes the 'Advantage 2' linkable, programmer/controller. See 'Advantage 3' data sheet for full details and specification.

Stock Reference 548-055

Description

'Advantage 3' linkable, programmer/controller

Advantage 3 programmer/controller heat treatment unit upgrade kit

Contains the necessary parts and instructions required to upgrade any make or model heat treatment unit to provide the additional functionality, user benefits and cost savings provided by the 'Advantage 3' linkable

programmer/controller. See 'Advantage 3 upgrade kit' data sheet for full details and specification.



Stock Reference

12300

Spare Advantage 2 programmer/controller

Replacement 'Advantage 2' linkable, programmer/controller. Superseded by the improved 'Advantage 3' linkable, programmer/controller though

heat treatment unit upgrade kit

Stock Reference 548-051

Description

stocks of the 'Advantage 2' will be held by Cooperheat and remain available until end of 2009.

Description

'Advantage 2' linkable, programmer/controller

Thermocouple wire

Type K nickel chrome/nickel aluminium thermocouple wire, insulated with high temperature glass braid. Recommended maximum temperature 800°C. A consumable item, which is used to convert the thermal energy at the hot junction of the thermocouple to an electrical mV signal which can then be used by temperature control and recording instruments to accurately record and control the temperature of the item being heat treated.

5.6.0

Conforms to: BS EN 60584-1 : 1996 part 4 BS EN 60584-2 : 1993 class 1 and ANSI-MC96

The thermocouple wire is attached directly to the work piece using the 'thermocouple attachment unit' Stock Reference: 41756 (110V unit) or 41757 (230V unit).



Stock Reference

43000

100m roll of type K thermocouple wire

Description

COOPERHE



High temperature putty

A small portion of the soft putty is fixed over the hot junction of the thermocouple, which is attached to the item being heat-treated. Once the putty dries, after 20 minutes, it hardens to protect the hot junction and helps avoid possible short circuit of the thermocouple wires which would result in temperature control and recording errors.

Stock Reference 43007 Description Jar of high temperature putty

Thermocouple connectors

Type K plug and socket thermocouple connectors. We offer two types of thermocouple plugs, type 516-111 being the standard type normally used with compensating cable. Whereas type 516-125 'quick connection' plugs are

Stock Reference

516-111

516-112

516-115

516-125

ideally suited for use with thermocouple wire where regular connections are required. The 'quick connect' plug can be attached to thermocouple wire in seconds and reduces waste caused by the loss of terminal covers.

Description

Type K, inline plug (standard connection) Type K, inline socket Type K, inline plug (quick connection) Type K, panel mounted socket





60A in-line connectors

Spare connectors for repair of splitters and heating elements.

Stock Reference	Description
508-009	60A brass male connector
508-010	60A brass female connector
508-019	60A fibre male sleeve for use with 508-009
508-020	60A fibre female sleeve for use with 508-010
508-022	60A fibre pin for use with 508-019 and 508-020
508-040/M	12.7mm wide copper shim (per metre) for use with 508-009 and 508-010

300A in-line connectors

Spare connectors for repair of triple cable sets and splitters.

Stock Reference	Description
508-006	300A brass male connector
508-007	300A brass female connector
508-015	300A fibre male sleeve for use with 508-006
508-016	300A fibre female sleeve for use with 508-007
508-021	300A fibre pin for use with 508-015 and 508-016
508-041/M	19mm wide copper shim (per metre) for use with 508-006 and 508-007



300A panel mounted connectors

Spare panel mounted connector sockets for repair of heat treatment modules and heat treatment units. Supplied complete with fibre washer and lock nut.

Stock Reference

508-001

508-002







Splitter cables

Description

For use with triple cable sets. Splitters are used where the operator needs to connect multiple heating elements, in parallel, to triple cable sets to enable the control of multiple heating elements. This enables

300A panel mounted sockets

300A panel mounted plugs

Stock Reference 32001 32002 32003 32004 the heating elements to be grouped to a single control output from a heat treatment unit to allow accurate zonal temperature control.

Description 2 Way splitter 3 Way splitter 4 Way splitter 5 Way splitter

Triple cable sets

For use with heat treatment units controlling 30V, 40V, 60V and 80V heating elements. Includes two double insulated cables for power feed and return, fitted with 300A male and female connectors and one compensating cable fitted with type K thermocouple plug and socket.

Stock Reference	Description
35020	15m Triple cable set 135A
35024	30m Triple cable set 135A
35032	30m Triple cable set 180A
35033	30m Triple cable set 280A



Suitable for use with type K thermocouples where monitoring thermocouples, in addition to the control thermocouples, are required for temperature monitoring purposes. Available in 30m lengths complete with type K thermocouple plug and socket or

Stock Reference

34000

34008



30m compensating cable c/w type K thermocouple plug and socket 100m roll of compensating cable without thermocouple plug or socket

in 100m rolls without plug and

socket (plugs and sockets can

be supplied separately as





Compensating cable link cables



To link controller/programmer thermocouple input to the recorder input.

Stock Reference 34013

Description

control lead

Description

3m 'jumper' compensating lead fitted with two type K thermocouple plugs

Programmer/contactor control leads

To connect separate, external controller/programmer units output to power source control input.





Stock Reference

33009

110V supply plugs and sockets

3m, 3-core, programmer/contactor

Spare in-line plugs and panel-mounted sockets for repair of 110V supply cables and supply outputs.

Stock Reference	Description
516-040	Large yellow, 110V, 16A, 3 round pin, industrial (BS4343) panel mounting socket
516-040/1	Yellow, 110V, 16A, 3 round pin, industrial (BS4343) panel mounting socket
516-041	Yellow, 110V, 16A, 3 round pin, industrial (BS4343) in-line plug

110V control plugs and sockets

Spare in-line XLR plugs and panel-mounted sockets for repair of 110V control cables and control inputs and outputs.

Stock Reference	Description	1
516-100	3 pin XLR type panel mounting plug for 110V contactor control	2
516-101	3 pin XLR type panel mounting socket for 110V contactor control	
516-102	3 pin XLR type in-line socket for 110V contactor control	
516-103	3 pin XLR type in-line plug for 110V contactor control	





Winder banding machines For tightening, cutting off and clipping mild and stainless steel banding. Stock Reference Description 29256 Winder banding machine (for mild steel banding) 29255 Ratchet banding machine (for mild and stainless steel banding)



Tie wire

For heating element bands of less than four heating elements, soft iron wire is adequate to fix the heating elements and insulation around the work piece.

Stock Reference 29266 Description Soft iron wire (25kg roll)

Banding tape

Stock Reference

29257

29259

For bands of more than four heating elements, Cooperheat recommends that mild steel banding and banding clips are used to ensure the heaters remain in full contact with the pipe. For temperatures in excess of 650°C we recommend using stainless steel banding and clips.

(Note: That mild steel banding should not be used on Chrome Molybdenum post weld heat treatments).





Banding clips

Description

Mild and stainless steel clips for fastening mild and stainless steel banding.

Mild steel banding (30m roll)

Stainless steel banding (30m roll)

Stock ReferenceDescription29258Mild steel banding clips (box of 100)29260Stainless steel banding clips (box of 100)





Elastic straps

Used to temporarily hold ceramic pad heating elements in place whilst they are correctly positioned and spaced prior to fixing in place with tie wire or banding.

to be broken to break down a

with welded cold tail kits' only

with welded cold tails.

Stock Reference 29253

to repair.

Description Elastic, 850mm strap with hooks

Heater repair kits

Heater repair kits provide a cost effective method of repairing burnt out Ni Cr heating elements by recycling heating element beads and connectors.

The repair kits include the necessary core wire with welded tails and the beads required to

Stock Reference	Description
29448	80v (60/16) Heater Repair Kit c/w Beads (5 heaters)
29449	60v (60/16) Heater Repair Kit c/w Beads (5 heaters)
29450	80V (80/20) Heater Repair Kit c/w Beads (5 heaters)
29451	60V (60/16) Replacement Heate Wire c/w Cold Tails
29451/30	30V (60/16) Replacement Heate Wire c/w Cold Tails
29452	80V (60/16) Replacement Heate Wire c/w Cold Tails
29453	80V (80/20) Replacement Heate Wire c/w Cold Tails
29455	60V (80/20) Heater Repair Kit c/w Beads (5 heaters)
29455/30	30V (80/20) Heater Repair Kit c/w Beads (5 heaters)
29456	60V (80/20) Replacement Heate Wire c/w Cold Tails
29457	30V (80/20) Replacement Heate Wire c/w Cold Tails





Heater beads

Ceramic, sintered alumina beads for repair and manufacture of ceramic pad heating elements.

Stock Reference	Description
500-003	Main body beads
500-001	Starter beads
500-002	Finisher beads
500-004	Main body hole beads
500-008	Tail beads

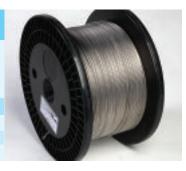


Heating element wire

Heating element core wire and cold tail wire for repair and

Stock Reference 502-050 502-003 502-001 manufacture of ceramic pad heating elements.

Description 19 strand 80/20 core wire 19 strand nickel 212 cold tail wire 19 strand 60/16 Ni Cr core wire





Superwool insulation

Superwool is a high temperature insulating fibre blanket manufactured from Calcium Magnesium Silicate. This material has a thermal performance equivalent to refractory ceramic fibre up to 1200°C. However, unlike ceramic fibre, Superwool is body soluble and has a larger needle particle size. These qualities mean that Superwool represents a lower respiratory hazard than ceramic fibre,

Stock Referer	nce
96kg per m ³	128kg per m ³
29800	29900
29801	29901
29802	29902
29803	29903
29804	29904
29805	29905
29806	29906
29807	29907
29608	29611

although, as with all high temperature insulating fibre, normal respiratory protection in the form of an appropriate dust mask should be worn during handling.

Superwool is available in a range of mat sizes, protected by a stainless steel mesh to extend the working life of the insulation. Alternatively, Superwool is also supplied in unmeshed rolls.

25mm thick s/s meshed mat 300mm x 300mm 25mm thick s/s meshed mat 300mm x 600mm 25mm thick s/s meshed mat 300mm x 900mm 25mm thick s/s meshed mat 600mm x 600mm 25mm thick s/s meshed mat 600mm x 1200mm 25mm thick s/s meshed mat 600mm x 1800mm 25mm thick s/s meshed mat 300mm x 1800mm 25mm thick s/s meshed roll 7320mm x 610mm

Density: 96kg or 128kg per metre cubed. Material Safety Data Sheet available upon request.

Description

Cooperknit insulation

Cooperknit insulation is a cost effective knitted, silica fibre with many user benefits including reusability, long life and low risk to user health and safety and minimal skin irritation compared with most other high temperature insulating fibres.

Independent tests on Cooperknit have shown that no respirable fibres were found in any samples after exposure to 1000°C for 24 hours. Cooperknit can be used repeatedly at continuous operating temperatures up to 950°C without loss of thermal or mechanical properties.

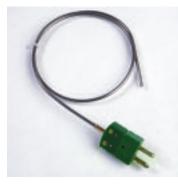
Cooperknit is available in a range of standard mat sizes detailed below, we are also able to supply special mat sizes or configurations to meet your exact requirements. Alternatively, Cooperknit is also supplied in 7.5m long rolls.

Stock Reference	Description	
29700	10mm thick mat	300mm x 600mm
29701	10mm thick mat	600mm x 600mm
29702	10mm thick mat	900mm x 600mm
29703	10mm thick mat	1200mm x 600mm
29704	10mm thick mat	1800mm x 600mm
29699	10mm thick roll	7500mm x 600mm



Density: 187 - 194kg per metre cubed. Material Safety Data Sheet available upon request.





Tubular, stainless steel sheathed thermocouples

Commonly used for temperature measurement in small furnaces and ovens.

Stock Reference	Description
42001	0.6m stainless steel sheathed type 'K' thermocouple with fitted thermocouple plug
42002	1.8m stainless steel sheathed type 'K' thermocouple with fitted thermocouple plug

Single pole contactors

Replacement single pole contactors and contacts for 0-65V and 0-85V output heat treatment modules and units.

Stock Reference	Description
526-054/SA	Single pole 250A contactor (assembled)
526-056	Fixed contact for single pole contactor
526-057	Moving contact for single pole contactor
526-070	Single pole contactor for use with units 11000 and 11100



Double pole contactors

Replacement double pole contactors and contacts for 32.5-0-32.5V and 42.5-0-42.5V output, heat treatment modules and heat treatment units.

Stock Reference 526-059/SA 526-059/1 526-059/2

Description

Double pole 250A contactor (assembled) Fixed contact for double pole contactor Moving contact for double pole contactor

Circuit breakers

Replacement mains circuit breaker for heat treatment	modules and heat treatment units.
Stock Reference	Description
522-050	125A circuit breaker for 50kVA heat treatment modules and heat treatment units
522-051	160A circuit breaker for 75kVA heat treatment modules and heat treatment units
522-065	160A circuit breaker for use with 11100 unit
522-066	100A circuit breaker for use with 11000 unit





TAU spares

Replacement parts for Thermocouple Attachment Units (TAUs).

Stock Reference	Description
558-027	TAU rechargeable battery, 3 Amp hour, 12V d.c
536-128	Pliers and magnet set for TAU
536-058	Replacement TAU shoulder strap and clip

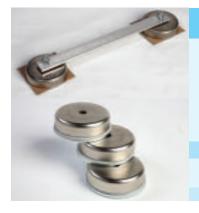


Recorder spares

Replacement parts for temperature chart recorders.

Stock Reference (Fuji)	Description
542-266	Chart paper for 12 point Fuji temperature chart recorder
542-277	Recorder Print Head Cartridge for 12 point Fuji temperature chart recorder
542-278	Carriage motor for 12 point Fuji temperature chart recorder
542-279	Chart motor for 12 point Fuji temperature chart recorder
542-280	Timing belt for 12 point Fuji temperature chart recorder
542-281	Drive cable for 12 point Fuji temperature chart recorder





FIP magnets

Pair of powerful limpet magnets with cross bar used to quickly clamp Flexible Insulated Preheaters (FIPs) to the work piece being preheated.

Stock Reference

29269 536-001 Description Assembled pair of limpet magnets with cross bar Replacement, single, limpet magnet

SCU plaque and gasket set

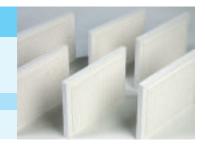
Replacement parts for repair of Surface Combustion Units (SCU).

Stock Reference

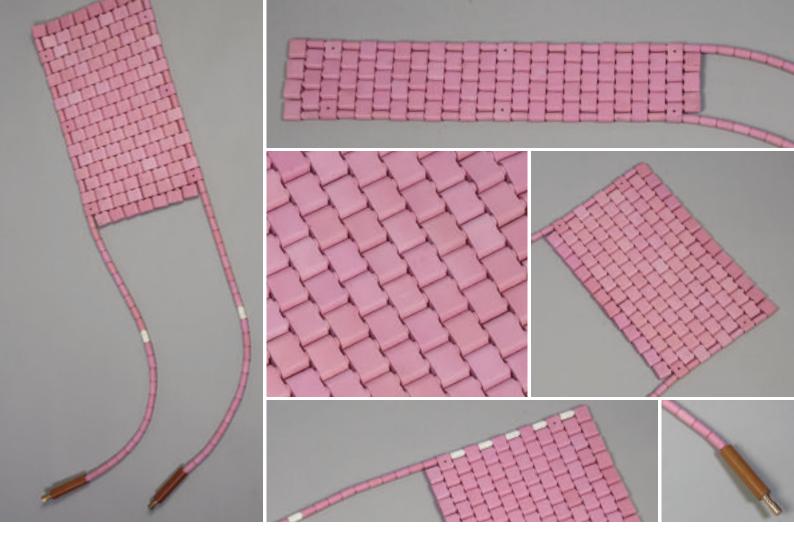
6262/P/15

Description

Replacement set of six SCU plaques & gaskets







Cooperheat Flexible Ceramic Pad (FCP) Heating Elements

Cooperheat use the highest quality materials available in the construction of our Flexible Ceramic Pad (FCP) heating elements. These materials make the heating elements highly durable, which extends the usable life of Cooperheat heating elements beyond that normally expected. This extended life, high durability and reliability combine to save you money by:

- Reducing reworks and lost time due to heating element failures.
- Reducing your annual costs for replacing or repairing failed or damaged heating elements.

Cooperheat ceramic heating elements are constructed from high grade sintered alumina ceramic beads, Nickel-Chrome core wire and Nickel cold tail wire. The construction allows the heating element to be flexible and provides high heat transfer efficiency.

Cooperheat insist on using high quality, ceramic beads, with a

high resistance to thermal and physical shock, in the construction of FCP ceramic heating elements.

The important physical properties, which make these beads superior to other beads used in the heat treatment industry, are detailed in the ceramic bead physical properties table below:

Alumina content	95%					
Bulk density fired	3.7 Mg/m ³					
Grain size	6µm					
Vickers hardness	12.5					
Rockwell hardness	78 (R45N)					
Compressive strength	2000 MPa					
Flexural strength	320MPa (ASTM C1161, 3 point)					
Young's modulus	325 Gpa					
Thermal conductivity	21W/m ³					
(All dimensions are nominal)	(All dimensions are nominal)					

COO

These beads are supplied to Cooperheat by one of the leading, ISO 9002 accredited, specialist ceramic manufacturers in the ceramic industry.

The cold tails of Cooperheat ceramic heating elements are butt welded to the heater core wire which eliminates the cold tail/core wire junction failures often seen with low quality heaters which use steel ferrules.

By selection, from the extensive

range of Cooperheat FCP heating elements, any pipe size or pipe configuration can be covered so that the correct amount of heating power can be applied to successfully heat treat the pipe weld or other fabrication. Cooperheat FCP heating elements are manufactured with a range of power ratings for use with a selection of standard voltages. If you require any special heating element configuration, voltage or power rating, Cooperheat will use their heat treatment

engineering expertise to provide you with a heating element custom built to meet your exact needs.

Cooperheat FCP heating elements can, if handled correctly, be used approximately fifty times at temperatures up to 1050°C (1922°F).

Cooperheat can provide higher temperature heating elements if required which can be used repeatedly at temperatures up to 1200°C (2192°F).

Specifications (80/20 Core Wire):

(All dimensions are nominal)

Stock Reference	Type Reference	Width (tail to tail) mm inch		Length (of h mm	neater body) inch	Volts v	Power kw
20030	CP3	75	3.00	670	26.50	60	2.70
20031	CP4	100	4.00	505	19.50	60	2.70
20032	CP6	150	6.00	335	13.00	60	2.70
20033	CP8	205	8.00	250	9.75	60	2.70
20034	CP10	255	10.00	210	8.00	60	2.70
20035	CP12	305	12.00	165	6.50	60	2.70
20036	CP15	380	15.00	145	5.75	60	2.70
20037	CP16	410	16.25	125	5.00	60	2.70
20038	CP21	535	20.50	105	4.00	60	2.70
20039	CP24	610	23.50	85	3.25	60	2.70
20040	CP10L	250	10.00	85	3.25	30	1.35
20041	CP48	1220	47.25	45	1.75	60	2.70
20042	CP20L	500	19.50	45	1.75	30	1.35
26260	CT78	25	1.00	1950	77.00	60	2.70
26261	CT36L	25	1.00	915	36.00	30	1.35
21030	СРЗН	75	3.00	925	35.50	80	3.60
21031	CP4H	100	4.00	690	27.00	80	3.60
21032	CP6H	150	6.00	465	18.25	80	3.60
21033	CP8H	205	8.00	360	14.25	80	3.60
21034	CP10H	255	10.00	295	11.25	80	3.60
21035	CP12H	305	12.00	230	9.00	80	3.60
21036	CP15H	380	15.00	190	7.50	80	3.60
21037	CP17H	420	16.50	165	6.50	80	3.60
21038	CP21H	535	21.00	145	5.75	80	3.60
21039	CP33H	840	33.00	85	3.25	80	3.60
21041	CP66H	1680	66.00	40	1.50	80	3.60
21042	CP30L	760	30.00	40	1.50	40	1.80
22005	CP24H	610	24.00	335	13.00	220	9.90
22006	CP26H	660	26.00	335	13.00	240	10.80

1) Stock References: 22005 and 22006 are for use up to a maximum temperature of 600°C.

2) For heating elements for use at temperatures up to 1200°C add the prefix 'K' to the stock reference.

Heating Element selection guide

(For heat treatment cycles up to 800°C)

To be used as a guide only. Reference should always be made to specific code or specification heated band width requirements.

Nomina	al Bore	Pipe wall thickness inches / (mm)						
Inches mm		0-0.8 / (0-20)	0.8-0.9 / (20-23)	0.9-1.1 / (23-28)	1.1-1.4 / (28-36)	1.4-1.8 / (36-46)	1.8-2.4 / (46-61)	
1	25.4	1 x CP48	n/a	n/a	n/a	n/a	n/a	
2	50.8	1 x CP8	n/a	n/a	n/a	n/a	n/a	
3	76.2	1 x CP12	n/a	n/a	n/a	n/a	n/a	
4	101.6	1 x CP15	n/a	n/a	n/a	n/a	n/a	
6	152.4	2 x CP12	2 x CP12	n/a	n/a	n/a	n/a	
8	205.2	2 x CP15	2 x CP10	2 x CP10	n/a	n/a	n/a	
10	254	3 x CP12	4 x CP8	4 x CP8	n/a	n/a	n/a	
12	304.8	4 x CP10	4 x CP10	4 x CP10	2 x 4 x CP10	n/a	n/a	
14	355.6	3 x CP15	4 x CP12	6 x CP8	6 x CP8	2 x 4 x CP12	n/a	
16	406.4	2 x 4 x CP12	2 x 4 x CP12	2 x 4 x CP12	2 x 5 x CP10	2 x 5 x CP10	n/a	
18	457.2	2 x 4 x CP15	2 x 4 x CP15	2 x 4 x CP15	2 x 5 x CP12	2 x 5 x CP12	n/a	
20	508	2 x 5 x CP12	2 x 5 x CP12	2 x 5 x CP12	2 x 5 x CP12	2 x 6 x CP10	2 x 6 x CP10	
22	558.8	7 x CP10	7 x CP10	8 x CP10	n/a	n/a	n/a	
24	609.6	2 x 5 x CP15	2 x 5 x CP15	2 x 6 x CP12	2 x 6 x CP12	2 x 6 x CP12	2 x 7 x CP10	
47	1193.8	2 x 12 x CP12	2 x 12 x CP12	2 x 12 x CP12	3 x 12 x CP12	3 x 12 x CP12	3 x 12 x CP12	
63	1600.2	2 x 15 x CP12	2 x 15 x CP12	2 x 15 x CP12	2 x 15 x CP12	2 x 15 x CP12	3 x 15 x CP12	

Example: 2 x 12 x CP12 = Two bands of twelve CP12 FCP heating elements.

Flexible Insulated Preheaters (FIP's)

Application

Flexible insulated preheaters (FIP's) can be used either flat or laid over curved surfaces. They are equally suitable for preheating pipework, fabrications and vessels either longitudinally or circumferentially.

Specification

The FIP is designed to provide preheating up to a temperature of 250°C.

80/20 Core Wire FIP Heaters:

The element is identical to that used in the FCP heater, but has a high grade ceramic fibre thermal insulating mat protected by a stainless steel backing.

A feature of this heater is the holding magnets for fast adhesion to their workpiece.

These can be supplied either as a separate item, or built into the heater element.

User Benefits

As with all Cooperheat products the FIP heater is competitively priced and in addition:

- Has magnetic attachment for fast, low cost installation;
- Has protection from weld spatter;
- Operates on low voltage for operator safety;
- Is strongly constructed for on-site reliability.

(All dimension				
Heater Stock No	Type Reference	Wi mm	dth ins	l mm

Heater Stock No	Type Reference	Wie mm	dth ins	Ler mm	ngth ins	Volts	kw	Replaceme Stock Number	ent Element Type Reference
22062	-	125	5	810	32	60	2.7	20050	-
22063	-	125	5	940	37	80	3.6	21050	-
22070	FIP 295	100	4	750	29.5	60	2.7	20030	CP3
22071	FIP 235	125	5	585	23	60	2.7	20031	CP4
22072	FIP 395	100	4	1000	39.5	80	3.6	21030	CP3H
22073	FIP 305	125	5	775	30.5	80	3.6	21031	CP4H
22075	-	930	36.5	110	4.25	80	3.6	21039	СРЗЗН

Cooperheat

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