


1-1-1983

## H & V News

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# H&V NEWS



● **WASTE & WATER TREATMENT**

● **PIPEWORK DESIGN FOR SOLID FUEL**

● **COMPRESSED AIR & ENERGY CONSERVATION**

● **FILTERS FANS & AIR HEATERS**

● **ENERGY COSTS**

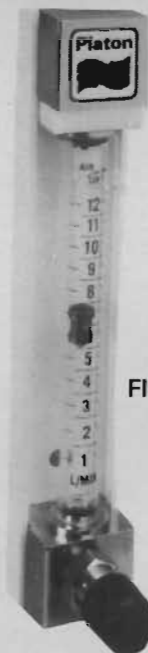
# A Condensed Guide to MANOTHERM activities

## THOMMEN CALIBRATOR EM



Type EM 421  
410 x 260 x 230 mm  
approx. 8 kg

Indep. from mains Separate power supply 24V D.C.

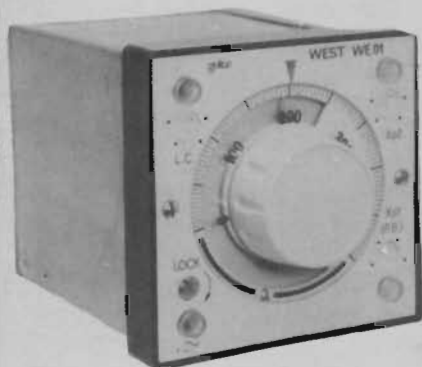


Platon Flowmeter



Barksdale piston pressure switch  
for pressures up to 315 bar.

## West WE 01 process controller

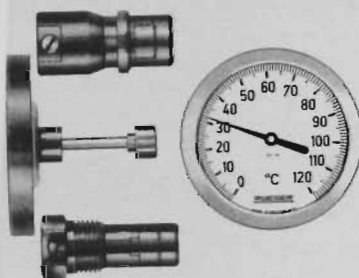


96mm square metal case.  
PD+PI control action.

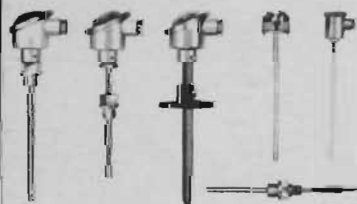
Limit comparator & controlling  
output option.



Platon 'M'-valve.  
Air operated miniature  
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for automatic  
control of  
most media.



Rueger thermometers.



Thermocouples &  
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Phone 645966



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# H&V NEWS

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# IHVEX '83 — Showplace for Industry

As almost all the space has been booked and the CIBS have announced details of their conference, IhVex '83 looks set for success. In the current difficult times for the construction industry it is heartening to see the services industry put so much into what is the show place of the industry. A great emphasis will be placed on conservation and energy management with much of the equipment on display and of course gas and solid fuel equipment will also feature prominently.

The theme of the CIBS symposium is computers and it is hoped that some hardware and software will be on show and available for display during the day to demonstrate the systems being discussed. So all seems set for an exciting three days show and on the day of the symposium those attending will undoubtedly be brought right up to date with all the latest technology and information on computers in the services industry.

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### COVER PIC

● Our cover photograph this month is of a series of floating aerators installed by Harper & Fay Ltd. in a first stage lagoon of the effluent treatment plant at Golden Vale Food Products Charleville, Co. Cork. The plant is designed to produce a high quality effluent for discharge into a stream.

Photography: Kingray Studios



**NEWS**



Frankfurt is preparing for the ISH International Trade Fair Sanitation Heating Air-Conditioning 1983 on 22-26 March 1983. This Fair has acquired tradition and has

become the leading international trade fair for the services industry.

ISH offers a complete presentation of European sanitation and heating equipment and the widest range of information on technical developments — this is an important function for the installation sector of the trade.

ISH is unequalled as a display which demonstrates design trends at home and abroad — this offers an interesting review for architects, builders, interior designers. It is also a meeting-point for all those working together on the sanitation and heating sector, from the manufacturer through the dealer and fitter to the builder and his architects.

The ISH has never been a fair of the utopian and it will continue in 1983 to be strictly oriented to realities. Further information on travel is available from LEP (Ireland) Ltd., 11/15 Tara St., Dublin 2, (Tel. 771861 Telex 5252).

## Government Approves Gas Terms

The Government has approved the terms for the supply of Kinsale Gas to the Dublin Gas Company together with Conversion and Development programmes which the Company will carry out. Under these terms Kinsale Gas will be available to the 150,000 consumers in Dublin in early January.

Initially the Natural Gas will be reformed into town's gas. However as the conversion programme proceeds and as householders have their appliances converted at no cost there will be a progressive change over to direct use of Natural Gas.

In addition, under the development programme the gas will be brought over a period of four years directly to 100,000 new consumers in South Co. Dublin Tallaght, Clondalkin, Lucan, Blanchardstown, Finglas, Swords and Malahide.

The terms of the supply contract have been accepted by the Board of the Dublin Gas Company.

The benefits of natural gas will be immediate for Dublin's gas consumers. Domestic consumers can expect price reductions of up to 40%. This means that the two monthly-bill

in homes where gas is used will be replaced from about £112 to £64 giving a saving of about £48 every two months. Where gas is used for cooking there will be a fall in prices in the region of 25%.

Further significant reductions in price for household consumers can be expected over the next three years. The overall effect of these reductions will be about 46% in domestic heating and 36% in cooking.

The savings for light industries will be even more dramatic up to 60% in some cases at present levels of consumption.

But why convert to direct usage of natural gas? Why should the company not just substitute natural gas for its Naphtha feedstock and continue to reform town gas?

The answer is simple. Direct usage is far safer and far more efficient. It enables the consumer to have the benefit of the most modern and efficient gas burning appliances — a major selling point for gas. It means that the gas delivered to homes in Dublin will be non-toxic thus allaying any fears potential consumers may have about the safety of gas. It will make the best possible use of the company's existing grid system and obviate the

necessity for costly mains re-inforcement for some years.

Make no mistake about it though, conversion is a major task. It will involve 150,000 homes and businesses and 250,000 appliances. It will be costly, between £100 and £200 per customer. These costs will not be passed on to the consumer but will be borne by the State and by the company in the interests of promoting the use of this clean high quality native Irish fuel.

Work has begun with a survey of customers gas appliances. This will be followed by the actual conversion programme which will be completed in about three years.

The Dublin Gas allocation alone is expected to reduce our energy import bill during 1983 by about £17m on present consumption levels. As the company are confident that they can expand the market for gas by nearly eight times the present level, savings on imports by the end of the decade should be very significant indeed, reaching a level of about £80 million a year in 1982 terms.

The Cork/Dublin natural gas project represents the first stage in the development of a national gas grid which

will bring Kinsale gas to other areas of the country, where this can be achieved on an economic basis.

It now seems very likely that the lay-on of natural gas to the Limerick and Waterford areas is a viable proposition and BGE have been given the necessary approval to proceed with plans to extend supply to these areas.

The Minister of Energy has recently concluded negotiation of the arrangements of the supply of Kinsale Gas to Northern Ireland. The final approval for this project which is a historic milestone in practical North/South Co-operation can be expected shortly from the British Government.

### APPOINTMENT



● Mr. John Carty has been appointed Area Sales Manager (Dublin) for National Coal Company.



## Products, Technology, Trends.

## Worldwide Product Offer at ISH.

ISH – the unique opportunity to be fully informed on the Sanitation, Heating and Air-Conditioning Industries. ISH provides the opportunity to gain comprehensive knowledge, which is becoming more and more important in the ever-increasing developments in technology.

Topical theme: The Economic Use of Energy. ISH shows solutions, improvements, international technology, prospects for the future.

ISH – that means dialogue between experts. For today and tomorrow. More than 9,000 experts from all over the world. More than 1,500 exhibition stands.

Additional informative shows and presentations.

**Environmental comfort  
by use of modern  
technology.**

## International Trade Fair for Sanitation, Heating & Air-Conditioning.

## Frankfurt am Main 22nd – 26th March, 1983



Information. Travel tips. Entrance tickets:

LEP (Ireland) Limited, 11/15 Tara Street, Dublin 2, Tel.: 77 18 61, Tlx.: 5252

NEWS

# SMC Apprentice Takes Top Award

Gene Fitzgerald, the then Minister of Industry and Commerce presented Michael McDermot of SMC Air Conditioning, Dublin with the Refrigeration Apprentice of the Year Award at the new AnCO Centre in Cork on Monday, 6 December, 1982. He was also presented with a cash award and a Savings Book by Michael Conlon, Chief Executive of Cork Trustee Savings Bank who sponsored the award.

The second place on the Refrigeration Course also went to another SMC Apprentice — Dermot Houston. This must be viewed as quite a spectacular achievement by any standards when one considers the extremely high number of entries throughout Ireland the fact that there were only two entries from SMC.

No doubt this will not come as any great surprise



● Pictured at the Refrigeration Apprentice of the Year Award at AnCO Centre in Cork on Monday, 6th December, 1982 were from left to right: Mr. John Conlon, Chief Executive of Cork Trustee Savings Bank; Mr. Desmond Devine, SMC Dublin; Mr. Gene Fitzgerald, Minister of Labour & Public Services; Michael McDermot, SMC Dublin; Mr. Tom McCarthy, Manager of AnCO; and Mr. Sean McCarthy, SMC Dublin.

to the many very large companies and consultants throughout the country who have been dealing with SMC over the past number of years and have had first-hand experience of the expertise and professionalism with which they approach their

contracts.

Their apprentices achieving such high honours is just a mirror reflection of the structure of the whole company itself. No doubt the trade will be eager to see if SMC can repeat this spectacular result for 1983.

## Third Generation from Estimation

Estimation Ltd., who have specialised over the past two and a half years in offering a total package of computer, programs, service and training for mechanical and electrical subcontractors, have now introduced the third generation of Estimation computer called Contractor 1.

The Contractor 1 is a compact desk top processor which uses both an internal 5 megabyte fixed disc and a 5¼" floppy disc together with length and count probes for use in the estimating phase for take-off direct from drawings.

As with previous Estimation computers, all coded entries are virtually eliminated by the use of descriptive overlays for the keyboard, but Contractor 1 also offers an interchangeable typewriter keyboard which, combined with the greatly increased

for payroll, accounting, word processing and other general functions.

Estimation place great emphasis on the fact that they supply a total package of hardware, software, service and training so that, for example, the situation where a supplier of hardware can say "it's a software problem" or vice versa, is avoided. If there is a problem, then Estimation will be

responsible for solving it.

A number of Irish companies have already been using Estimation's LS2000 system and Contractor 1, at around ST£11,000, will be only some 10 per cent more.

For further details contact Estimation Ltd., Highlands Road, Shirley, Solihull, West Midlands B90 4NL, England, (Tel: 021-704 3221. Telex: 338018).



● The Estimation system in operation.

### LETTER TO THE EDITOR

Re: ILAC Centre — Energy Use Management

Dear Sir:

I was unaware that my paper on this subject (presented to the Second National Conference on Energy Use Management) was being published in your issue of December 1982. Had I been made aware of this intention I would naturally have given credit to the other members of the design team, and the principal contractors responsible for services, as follows:

Architects — Keane Murphy Duff; Structural Engineers — Joseph McCullough & Partners; Quantity Surveyors — Austin Reddy & Company; Main Contractor — John Sisk & Son Ltd.; Air Conditioning — Climate Engineering Ltd.; Electrical Installation — C. J. Ryder Lawlor Ltd.; Sprinkler System — Irish Sprinkler & Fire Protection Co. Ltd.; Lifts — Lift Manufacturers Ltd.; and Micro Computer Control System — Temperature Control Services Ltd.

Yours faithfully, Robert Jacob, Robert Jacob & Partners, 36 Wellington Road, Dublin 4.

**NEWS**

# THE NATIONAL ENERGY AWARDS 1983

**Certificate of Merit**

Section: Small Industry Category; Prize: Shop Vac Ireland Ltd.; Recipient: Mr. Ray Beer, Chief Engineer.

Section: Large Industry Category; Prize: MacArdle, Moore and Company Ltd.; Recipient: Mr. Donal Fennelly, Group Service Manager.

Section: Large Industry Category; Prize: Pfizer Chemical Corporation; Recipient: Mr. Ken Horan, Energy Co-ordinator.

Section: Public Sector Category; Prize: Hospitaller Order of St. John of God; Recipient: Brother Bernadine Edwards, O.H., Chairman Energy Conservation Committee.

Section: Public Sector Category; Prize: Askeaton Swimming Club; Recipient: Mr. Patsy McCarthy, Honorary Pool Manager.

**Plaque**

Prize: Gypsum Industries Limited; Recipient: Mr. Bernard McCarthy, Energy Engineer.

Prize: Molex S.A.; Recipient: Mr. Tom Moore, Manufacturing Engineering Manager.

Prize: Asahi Synthetic Fibres Ltd.; Recipient: Dr. Pat Madden, Production Manager.

Prize: Rathduff Cheese Company Ltd.; Recipient: Mr. Brendan O'Donoghue, General Manager.

**National Trophy**

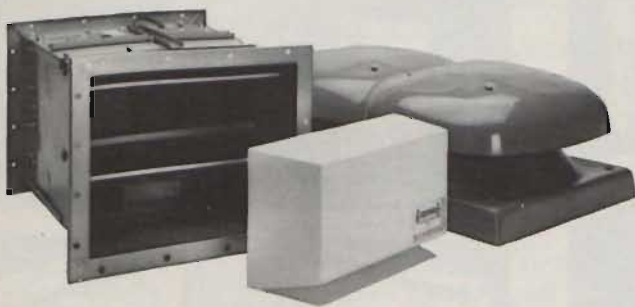
Section: Public Sector Category; Prize: University College Galway; Recipient: Mr. Bill Noone, Supervisor of Engineering Services/Energy Manager.

Section: Industry; Prize: Rathduff Cheese Company Ltd.; Recipient: Mr. John McCarthy, Energy Manager.



● Mr. Sean Fitzgerald, the then Assistant Secretary, Department of Industry and Energy presented the 1982 National Energy Conservation Awards for Industry and the Public Sector at a ceremony held at the Gresham Hotel, Dublin early in December 1982. Picture shows Mr. Sean Fitzgerald, (centre) with Mr. John McCarthy, (left) Energy Manager, Rathduff Cheese Company Ltd., Cork, winners of the National Trophy for Industry and Mr. Bill Noone, Supervisor of Engineering Services/Energy Manager, University College, Galway, winners of the National Trophy for the Public Sector Category after the presentations.

# THE BIGGEST RANGE OF VENTILATION IN THE NATION - FEATURES: GEMINI TWIN FANS



As more and more local authorities are specifying fans with a failsafe standby capability, Roof Units Group are increasing their range.

Besides the well proven twin roof extract unit, there is now a twin centrifugal in-line duct fan and a twin bathroom/toilet model.

All Gemini twin fans can be wired for full automatic change over should one motor fail or for shared duty as required.

**Also included in the biggest range of ventilation in the nation:-**

Apollo, Venus & Europak Roof Extract Units, Euroflow In-line Centrifugal Duct Fans, Euroseries & Eurofoil external motor axial fans, and the incredible Maico range of Unit Ventilators.

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SUPPLYING THE NATION'S VENTILATION

Peartree House, Peartree Lane, Dudley,  
West Midlands DY2 0QU.  
Telephone: No: Brierley Hill (0384) 74062.  
Telex: No: 335696 RUNITS G.

DUBLIN DAN CHAMBERS LTD., 57-58 BRUNSWICK STREET, DUBLIN 7. TEL: 01-720448



NEWS

# New Energy Savers from Walker

A new range of compact Caryle heat pumps and air cooled water chillers for the small commercial market, designated 30AQ and 30AE respectively, has been announced by Walker Air Conditioning Limited.

The heat pump units are particularly suited to new construction applications since they save the cost of a heating boiler. They are

available in three sizes from 5 to 15 TR (15,000 to 46,000 Kcal/H), and are ideal for comfort air conditioning in office buildings, shops, small hotels and schools.

The 30AE/AQ are more compact and, on average, 4% more energy efficient than their predecessors.

They are easy to install being pre-charged and

pre-wired, are engineered for long life, and feature a new multi purpose thermostat which accurately controls the leaving water temperature while providing freeze up and overheating protection. On 30AQ units a heater cable, would around the shell, provides additional protection in the depths of winter.

# Crane Acquire IMI Valve Services

In line with its policy of consolidating its industrial servicing operations Crane Ltd. has acquired the business of IMI Valve Services Ltd., a subsidiary of IMI plc (formerly Imperial Metal Industries Limited).

The Service Group of Crane Ltd., based within the company's 42-acre complex at Ipswich, is an acknowledged highly qualified and reliable organisation for the servicing and repair of industrial fluid handling equipment. The securing of the additional servicing facilities established and developed by IMI at Livingston, Spalding, Newton-le-Willows and Wednesbury, will strengthen the Group's capability for servicing.



● Pictured at a recent EMA meeting in Dublin on the topic of Compressed Air were left to right: Peter Brabazon, Energy Conservation Officer, Eastern Region; Dermot Walls, Energy Conservation Engineer, Aer Lingus; Prof. Seamus Timoney, UCD who chaired the meeting; John Kelleher, Bolton Street College of Technology; Alan Heggie, Sales Manager, Atlas Copco Ireland Ltd.

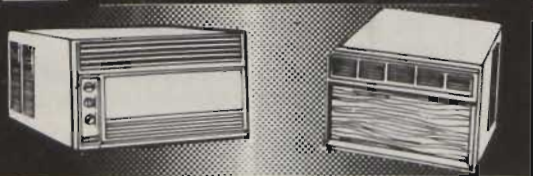


**Hall-Thermotank  
Ireland Limited**

**Refrigeration and  
Air Conditioning**



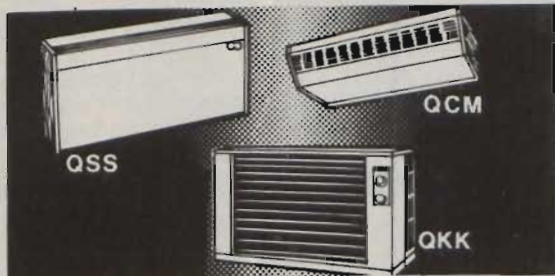
## QUALITAIR AIR CONDITIONING EQUIPMENT



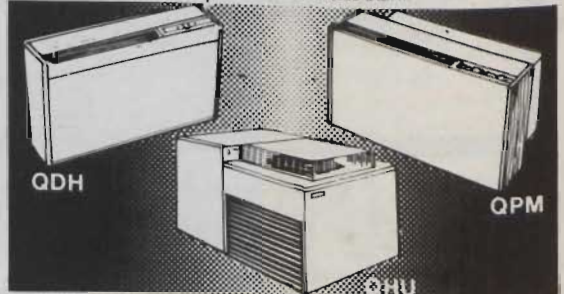
**QRU/QWR** window/wall mounting units, 6,000-23,000 Btu/h.



**QBU/QCU** split system units, 50,000 and 168,000 Btu/h



**QSS** split units, 9,000 - 24,000 Btu/h.  
**QCM** ceiling mounted split units, 18,500 - 24,000 Btu/h.  
**QKK** cool storage units, 7,500 - 14,000 Btu/h.



**QDH** dehumidifier  
**QHU** roof mounted units 50,000-82,000 Btu/h.  
**QPM** through wall mounting units, 10,000 and 12,700 Btu/h

Exclusive Irish Distributor for  
Qualitair (Air Conditioning) Limited

## Hall-Thermotank Ireland Limited

Hall House, Main Street, Rathcoole, Co. Dublin. Tel: (01) 580311 Telex: 30943

# Programme for CIBS Annual Symposium Computers & Building Services at the IhVex '83 Exhibition

9.00 Registration

9.30 Opening by Minister

## Session 1

9.45 The Basics on Computers

10.15 Evaluation of Hardware & Software

11.00 Coffee

11.15 The Computer in Use on Building Services  
Typical Case Study

12.00 Practical Parallel Sessions

1.00 Lunch

2.30 C.A.D. System

2.50 B.A.S.

3.10 Bills of Quantity

3.30 Tendering Estimating

3.50 Tea

4.50 Practical Session No. 2

5.00 Discussion

5.15 Close & Visit to Exhibition

Contact G. Palmer (Hon. Sec.) 17 Taney Rise, Dundrum, Dublin 14, Tel. 760621.

## FIRE SPRINKLER CONTROL

An ingenious solution to the shutting off of individual sprinkler heads in the event of false alarms, unauthorised tempering, minor fires, etc., without compromising system availability in other building zones, is now available from Cyril W. Bishop Pipe Freezing Services Ltd.

Known as Sprink-Off, it comes in kit form and comprises specially designed sprinkler head inserts which are simply located into the wall or ceiling mounted sprinkler head, compressing the sprinkler valve and stopping water flow immediately. To stop a fire sprinkler spray, a Sprink-Off insert is simply positioned onto the end of the telescoping pole provided. The insert is then located in the sprinkler head and the pole is twisted and pulled away leaving the insert securely in position and immediately stopping the sprinkler action.

With conventional sprinkler shut-down routines, the average system de-activation time is between 10-15 minutes. Normally resetting requires that the whole system be shut-off stopping water

flow even when only a localised area is affected. Thus about 500-750 gallons of water are deluged through each sprinkler head during the resetting time; damaging products, furnishings and stopping business operations until the mess is cleared up — another costly task.

Developed and patented in America, where it has found extensive applications in both industry and commerce, the Sprink-Off unit stops water flow from individual sprinkler heads immediately and without hazard. The user stands on the floor and positions the Sprink-Off insert into the activated sprinkler head in complete safety — the telescoping pole extends to give a reach of 22ft.

The Sprink-Off kit is supplied in a compact carrying case which can be wall-mounted and has full user instructions clearly displayed inside the lid.

Sprink-Off inserts are available for all types of sprinkler head, including flush fitting and recessed models. Each kit is therefore tailored to meet individual building requirements. Full details of sprinkler system type are therefore requested

when placing a Sprink-Off kit order. Three inserts are included with each Sprink-Off kit. Price at £95.00 sterling in the UK plus VAT the Sprink-Off Kit is completely maintenance free and the inserts can be used many times.

Available direct from Cyril W. Bishop Pipe Freezing Services Ltd., Clink Street, London S.E.1, the Sprink-Off kit complements the company's nationwide pipefreezing service, which is widely used for flow isolation of fire mains when conducting maintenance and modification programmes on live fire sprinkler systems.

## *Trianco — Worcester Settlement*

Trianco Redfyre Ltd. and Worcester Engineering Co. Ltd. are pleased to announce that the litigation between them concerning Worcester's earlier design of a Hoppamat boiler has been amicably settled on the basis of a licence agreement. The current design of the Hoppamat boilers remains in production.

## JRT Meets 'New Gas' Needs

The name of Potterton has been associated with gas heating from the early days of the industry, in fact the founder of the company took out a patent on an improved heating boiler in 1894 and introduced the first gas boiler for central heating using town's gas in 1904.

The name Potterton has long been associated in Ireland with John R. Taylor Ltd., Naas Road, Dublin 12. There are many examples of Potterton industrial, commercial and domestic gas boiler installations throughout the country. Now that Kinsale gas is at last a reality John R. Taylor have announced that they have extended their stock of domestic heating gas boilers and almost everything that the industry requires in gas boilers will be available from stock.

Part of the new breed of Potterton gas boilers stocked by JRT include open flued and balanced flued Kingfisher and wall mounted Flamingo boilers also the balanced flue wall mounted Netaheat boiler.

Contact John R. Taylor at 783255 for full details.



# Comparison of Useful Energy Costs Domestic Heating

Building Services News, Vol. 22, Iss. 1, 1983, Art. 1

FUEL	Form	Delivered Cost p/kWh	Useful Costs (p/kWh) for Different Appliances											
			Roomheater, Freestanding Boiler, Cooker		Open Fire with High Output Back Boiler		Open Fire		Flued Gas Room Heater		Boiler/Burner		Electric Fire	Storage Heater
			Efficiency 45% → 55%	Efficiency 30% → 40%	Efficiency 20% → 30%	Efficiency 75% → 82%	Efficiency 65% → 75%	Efficiency 100%	Efficiency 90%					
Peat	M/C Turf	0.96	2.13	1.75	3.20	2.40	4.80	3.20			1.48	1.28		
	Briquettes, loose	1.19	2.64	2.16	3.97	2.98	5.95	3.97						
	Briquettes, baled	1.10	2.44	2.00	3.67	2.75	5.50	3.67						
Coal	House Coal	1.21	2.69	2.20	4.03	3.03	6.05	4.03						
	Continental Anthracite Peas	1.68	3.73	3.05										
	Standard Anthracite	1.57	3.49	2.85										
	Rexco	2.33	5.18	4.24										
	Phurnacite	1.72	3.82	3.13										
	Extracite	1.76	3.91	3.20										
Oil	35 sec. Gas Oil	2.32									3.57	3.09		
	Kerosene	2.57									3.95	3.43		
Gas	Bottled L.P.G.	4.01							5.35	4.89				
	Towns Gas: Two Part Tariff	4.84							6.45	5.90	7.45	6.45		
	Full Rate	5.78							7.71	7.05				
Electricity	Off Peak	3.46												3.84
	Unrestricted	6.70										6.70		

- NB
1. Use manufacturers recommended fuel for each appliance
  2. Efficiencies quoted are seasonal efficiencies where  
Seasonal Efficiency = Conversion Efficiency x Utilisation Efficiency.
  3. Delivered energy costs quoted above are for conditions stated on IIRS Comparison of Energy Costs sheet.

# If you're looking for central heating Dunsley's well worth looking into

Dunsley manufacture a complete range of real fire solid fuel fires and boilers for complete home central heating.



## DUNSLEY CONDOR

A trend setting focal fire as seen on T.V. Designed for recessed or free-standing installations, the Condor is available in 2 design styles and 2 different colours. Ideal for traditional or ultra modern settings. Condor heats 4 to 6 radiators plus domestic hot water, and is also available in a 'Dry' version for non central heating installations.



100% British manufacture and DSFAAS approved.

# DUNSLEY

## DUNSLEY ENTERPRISE

The best selling fire and boiler unit installed by many Local Authorities throughout the U.K. New design, rugged construction and durable finish, the highly efficient Enterprise heats 4 to 6 radiators plus domestic hot water. Clever design and extra large ashpan cuts cleaning time to a minimum.

See the Dunsley Range on display at:  
**HEATING DISTRIBUTORS**  
**145/47 Richmond Road,**  
**DUBLIN 3.**

All Dunsley Appliances carry a 5 year Guarantee.

## DUNSLEY/BAXI



Dunsley also manufacture several other types of fire and boiler units including a version for the Baxi underfloor fire. All Dunsley appliances are highly efficient with high outputs for full central heating. 100% British manufacture and DSFAAS approved.



**Hall-Thermotank  
Ireland Limited**

**Refrigeration and  
Air Conditioning**



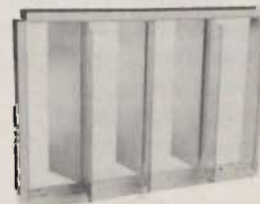
**PUNKAH LOUVRE**

High velocity spot cooling is provided by the Punkah Louvre. This unit is fully adjustable and can be used as either a jet or diffused air outlet. Fully adjustable for direction of throw, the Punkah Louvre is particularly useful where ventilation is required in remote areas as its air velocity reduces the length of branch ducting needed.



**DRUM LOUVRE**

The Drum Louvre is designed and developed for applications requiring long throws with a minimum of ductwork. It is manufactured in aluminium with a satin anodized finish which, together with a versatility of mounting, enables it to blend into any architectural scheme. It incorporates adjustable deflecting vanes for complete air control for large enclosures such as shopping precincts and other public areas.



**VOLUME CONTROLLER**

The volume controller is designed to fit into the ductwork behind the Drum Louvre. Its purpose is to direct the flow of air evenly at the louvre and provide a balanced flow through the blades. Its vanes are adjustable to enable a precise air flow to be achieved through the louvre.

**Hall-Thermotank Ireland Limited**

Hall House, Main Street, Rathcoole, Co. Dublin. Tel: (01) 580311 Telex: 30943

# Compressed Air and Energy Conservation

pressure drop and energy wastage. Where air is used to drive motors, valves and cylinders it is essential to provide adequate lubrication to reduce friction and wear thereby reducing energy consumption. Properly designed lubricating equipment for use with compressed air driven machinery should be installed. The equipment must be properly maintained and replenished with oil as recommended by the manufacturers.

Compressed air is widely used as a source of power because it is convenient, reliable and safe. The high power to weight ratio of the modern air turbine dictates its use in hundreds of applications. Its robustness, lightness and reliability make it an ideal choice both for hand tools and for applications where the environment would be unsuitable for electric motors. Because of its many advantages in these respects the high cost of compressed air as a power source is often overlooked. Compressed air is an expensive power source, between seven and ten times the cost of electricity. For this reason it is essential that compressed air be used only when economically justified. Good maintenance practice and in particular the elimination of waste can be very rewarding when applied to compressed air systems and equipment.

An energy conservation booklet prepared by the IIRS for the Department of Industry and Energy has recently been published and is designed as a review aid for the achievement of energy savings through effective maintenance and operation of compressed air system. The following is an extract from the booklet which is available from the IIRS, Energy Services, Ballymun Rd., Dublin 9, tel. 370101.

## Compressed Air Equipment

Compressed air is used for many purposes. Typical examples are air motors, drills, control valves, air guns for cleaning purposes, paint sprayers and many others. Unless pneumatic equipment is supplied with compressed air of adequate quality, wear and leakage is inevitable with consequent waste of energy. Filters safeguard air-using equipment by removing scale, water and oil from the supply. Filters should be situated as close as possible to the equipment they are protecting. They should be cleaned out regularly to prevent excessive

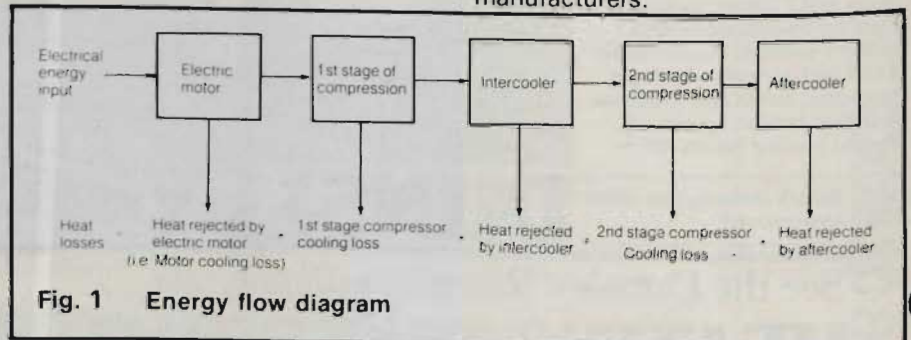


Fig. 1 Energy flow diagram

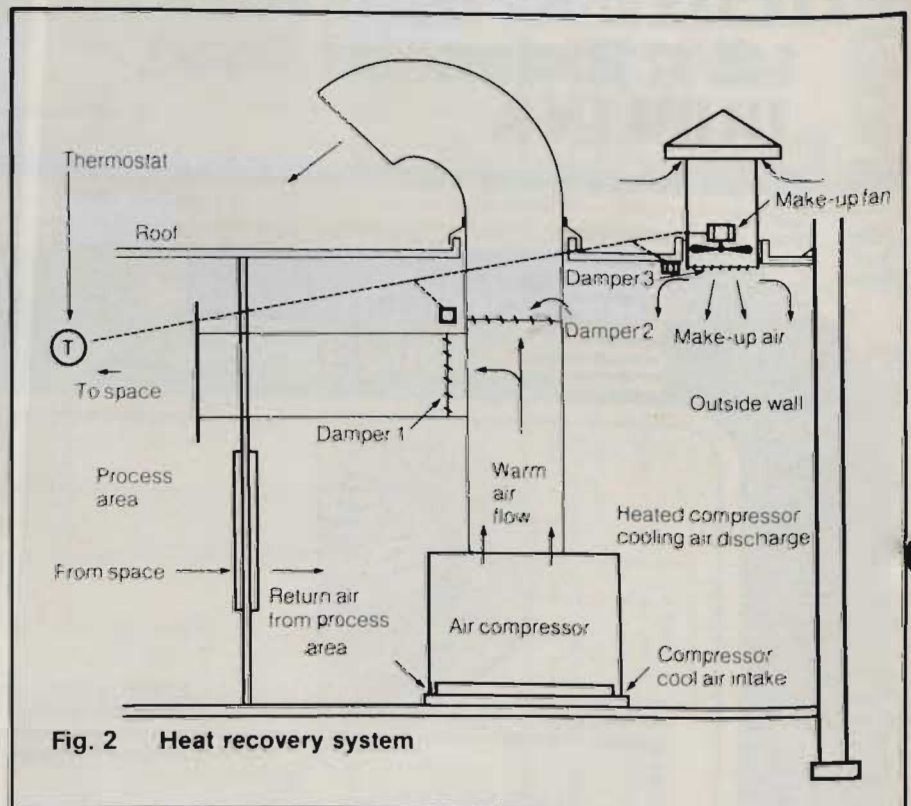


Fig. 2 Heat recovery system

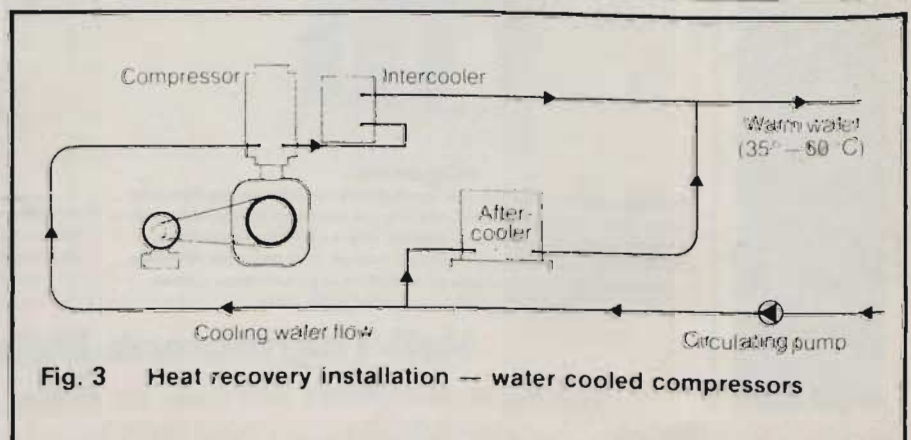


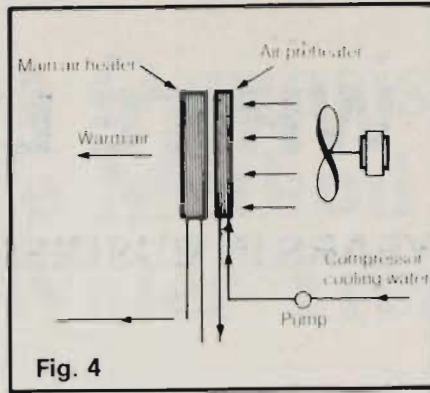
Fig. 3 Heat recovery installation — water cooled compressors

**Waste Heat Recovery**

A large proportion of the electrical energy used by a compressor is converted into heat which can be recovered and made available for heating purposes within the plant. Fig. 1 is an energy flow diagram for a typical compressed air installation. This diagram shows the flow of energy throughout the system and identifies where heat loss is taking place.

The above diagram illustrates the potential for the recovery of waste heat in the form of heat rejected by the compressor, the intercooler and the aftercooler. Compressor cooling is necessary to maintain reasonable working temperatures. Heat removed by the intercooler improves compression efficiency while heat removed by the aftercooler removes moisture from the compressed air. The cooling medium is either water or air and the heat absorbed by the cooling medium can be used for space heating, boiler feedwater preheating, process heating and for other uses within the plant. The quantity of heat removed is normally sufficient to provide water temperature in the range 35°C to 50°C in the case of cooling water and air temperature in the range 20°C-30°C in the case of cooling air. A heat recovery system for an air cooled compressor is shown in Fig. 2.

During the heating season warm air is ducted from the compressor directly into the process area which requires space heating. During the summer period warm air is ducted to the roof and discharged to the atmosphere. Make-up air is drawn into the compressor room by an electrically powered fan. The air temperature within the process area is monitored by a thermostat which in turn controls the positioning of dampers and the operation of the make-up fan. When the air temperature falls below the thermostat setting, dampers Nos. 2 and 3 are closed and the make-up fan is switched off. The warm air from the surfaces of the compressor is directed to the process area and the air temperature begins to rise. When the air temperature has risen above the thermostat setting the supply of warm air to the process area is shut off. This is achieved by closing damper No. 1. The make-up fan comes into operation to ensure a supply of cool air at the compression intake.



**Fig. 4**  
Heat from a water cooled compressor can be recovered by a cooling water circuit as shown in Fig. 3.

The cooling water (35°C-60°C) can be used in an air preheater battery as shown in Fig. 4.

Summary of energy saving measures to be adopted in the use of compressed air.

- (i) Use the correct type, size and location of compressor.
- (ii) Select an air intake that provides cool, clean, dry air.
- (iii) Maintain all items of compressed air equipment regularly.
- (iv) Dimension air receivers generously.
- (v) Provide the instrumentation to

undertake regular checks on system efficiency.

- (vi) Repair all air leaks.
- (vii) Use the lowest air pressure that will perform the job satisfactorily.
- (viii) Recover the heat of compression where economically viable.
- (ix) Provide for proper lubrication of the equipment.

**Recommended Compressor Test 'Pump up' test**

The performance and efficiency of a compressor can be simply and quickly checked by carrying out a 'pump up' test. A description of this test is as follows:

**Test preparation**

- Close all valves on system side of receiver, ie isolate receiver from system.
- Drain receiver.
- Measure height and diameter of receiver and compute its volume.
- Ensure that there are no leaks from the compressor/receiver system.

**Test equipment**

- Stop watch (an ordinary watch with a second hand will suffice)
- Continued on page 18

**Table A**

P (bar absolute)	Single stage compressor	Two stage compressor
4.46	3.92	4.36
6.53	2.97	3.42
7.91	2.59	3.04

**Note:**

Normal atmospheric pressure = 1.013 bar absolute  
Bar absolute = Bar gauge + 1.013

**Table B**

Temperature of air intake ( C )	Volume in m <sup>3</sup> required to deliver 1000 m <sup>3</sup> at 21 C	% kW saving or increase relative to 21 C
-1	925	7.5% saving
5	943	5.7% saving
10	962	3.8% saving
16	981	1.9% saving
21	1000	0 saving
27	1020	1.9% increase
32	1040	3.8% increase
37	1060	5.7% increase
43	1080	7.6% increase
49	1100	9.5% increase

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**WATER TREATMENT & FILTRATION SPECIALISTS**

# Reverse Osmosis — An Alternative Method for Boiler Feed Water Treatment

The only way to reduce the frequency of costly blow down is by improving the quality of the feed water supply to the boiler.

Ideally, the total dissolved solids content of the feed make-up water should be reduced to a minimum and this can be achieved by different forms of water treatment plant, most of which employ the ion exchange process such as base exchange softening, dealkalisation and two-bed deionisation. However, when using an ion exchange plant, the resins have to be regenerated thus resulting in 'down time' of the water treatment equipment. In many cases this can prove to be inconvenient as continuity of boiler feed is required particularly if the 'hot well' is small.

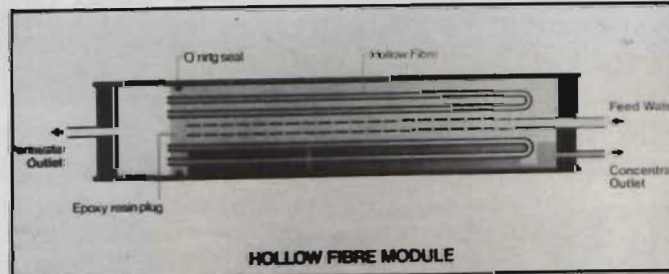
More recently, the technique known as reverse osmosis has been adopted for boiler feed water treatment.

Reverse osmosis operates on the principle whereby when a liquid comes into contact with a semi-permeable membrane at a pressure in excess of that liquid, water molecules will permeate

through the membrane surface leaving the solids behind. It can be used, therefore, as a method of purification.

A reverse osmosis unit can operate 24 hours per day and will remove — without the addition of any chemicals — approximately 90-95% of the total dissolved solids content from the raw water supply.

As a result of this efficient removal, the possibility of scale



● Picture shows a typical example of a hollow fibre reverse osmosis membrane.

formation is significantly reduced and the frequency of blow down minimised. Priming of the boiler is completely arrested and carry-over of mineral salts into the steam virtually non-existent.

In addition, the effluent from a reverse osmosis plant is simply a concentration of the solids

which were originally present in the raw water. This 'concentrate' is slowly bled to drain and the effluent can be discharged directly to any open sewage system without further treatment.

A large hospital was experiencing severe problems with its boiler operation. Although the raw water, which contained some 500 parts per million total dissolved solids with a total hardness figure of 350 parts per

million, was undergoing base exchange softening, blow down was taking place almost continuously. The calcium and magnesium salts were being converted to their sodium equivalents by the softener and this, together with the high bicarbonate value of the raw water resulted in sodium

carbonate precipitation in the boiler and the liberation of CO<sub>2</sub> which rendered the steam aggressive to steel.

The base exchange softener was, therefore, exchanging one problem for another and a tremendous amount of internal chemical treatment was necessary.

Severe space limitations within the hospital plant room eliminated the possibility of installing a dealkalisation plant combined with the problem of no acid resistant drains being available.

A system was designed whereby a reverse osmosis unit was installed between the base exchange softener and the boiler feed make-up tank.

The total dissolved solids content of the softened water dropped from 500 parts per million down to 35 parts per million resulting in a dramatic reduction in blow down frequency. The cost of internal chemical treatment was reduced by a factor of 15 and the problem associated with sodium carbonate and CO<sub>2</sub> was immediately solved.

A further saving was

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For further information contact:

R. S. White Ltd. The Crescent, Donnybrook, Dublin 4.

Telephone: (01) 693144 Telex: 33301





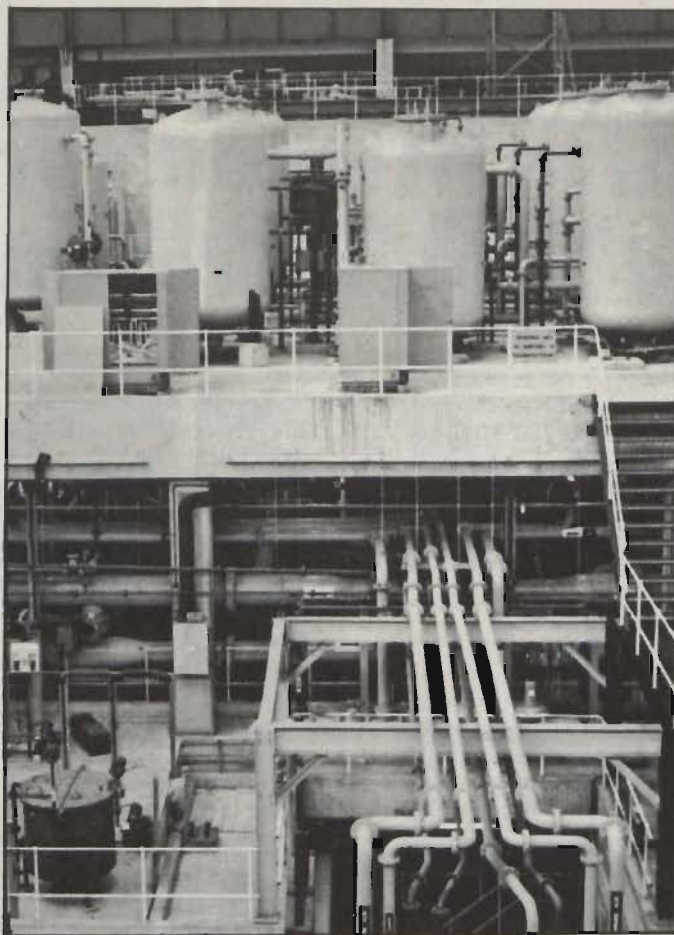
**WATER & WASTE TREATMENT**

realised since the system design allowed the softened concentrate from the reverse osmosis plant to be utilised for ordinary domestic services such as supply the kitchens, laundry and toilets.

**The following notes are based on material submitted by the companies concerned.**

## **RS White Limited**

If experience, reliability and quality are important when considering water treatment then R. S. White Ltd., in association with 'Permutit' have all these qualities. For over 50 years they have supplied equipment for nearly every application from portable de-ionisers for the small laboratory up to comprehensive water treatment for industrial steam boilers, municipal supplies and electronics industry.



● Power station make up water treatment plant by Permutit.

R. S. White Ltd., can also supply a complete range of packaged equipment i.e. filters, softeners, de-ionisers, dealkalisation plants and reverse osmosis units and have designed and supplied systems for many industries which require high quality water such as the fast developing micro electronics, soft drinks, pharmaceutical and brewery industry. Activities range from standardised treatment plant to total treatment engineering covering the conservation of water and it's economic use from supply to discharge of final effluent.

The treatment of any water will depend on the chemical analysis and site conditions in each individual case. If these are not readily available, R. S. White Ltd. can carry out a full mineral analysis and site survey and their representatives will be pleased to discuss and advise on every aspect of water treatment.



## **WHESOE (IRELAND) LIMITED**

Whessoe design and manufacture pressure vessels for the water treatment industry to BS5500, ASME VIII and specifications. Whessoe also design and manufacture storage tanks, free standing chimneys, marine buoys and LPG storage tanks. Contracts undertaken both at home and overseas.

**Jamestown Road,  
Finglas, Dublin 11.  
Telephone 342222  
Telex 25496**

**WATER & WASTE TREATMENT**

In order to provide a comprehensive after sales service and ensure maintenance of all plant after installation, there are fully qualified service engineers available to carry out general and contract service and a complete range of spare parts are stocked at Donnybrook.

R. S. White Ltd. are the sole agents in the Republic for Houseman (Burnham) Ltd., and Permutit Boby Ltd., and have the support and backing of the total commercial and technical resources of the internationally recognised Portals Water Treatment Group.

R. S. White Limited of Donnybrook, Dublin have just been appointed sole agents for Ireland for Water Saving Systems of Shrewsbury, England, a Division of the Shrewsbury Tool and Die Company. R. S. White will offer comprehensive service and engineering support to existing customers.

Following their appointment, Brian Keating, Managing Director said "We have been established for more than 50 years, and are proud of our reputation as skilled water treatment and filtrating engineering specialists. The Water Saver Systems product range will enable us to expand and offer an even wider service to Irish industry, and through their waste heat recovery units in particular we shall be able to contribute significantly to energy saving and to increased efficiency."

The company offers a wide range of purpose-built cooling systems for industry, concentrating particularly

on sealed systems. Typical applications include cooling systems for compressors, transformers, generators, furnaces and fluid power equipment.

Sealed systems have particular user benefits in that they dissolve no loss of cooling water, need on only minimal maintenance and eliminate scale and corrosion in pipework and internal passage-ways.

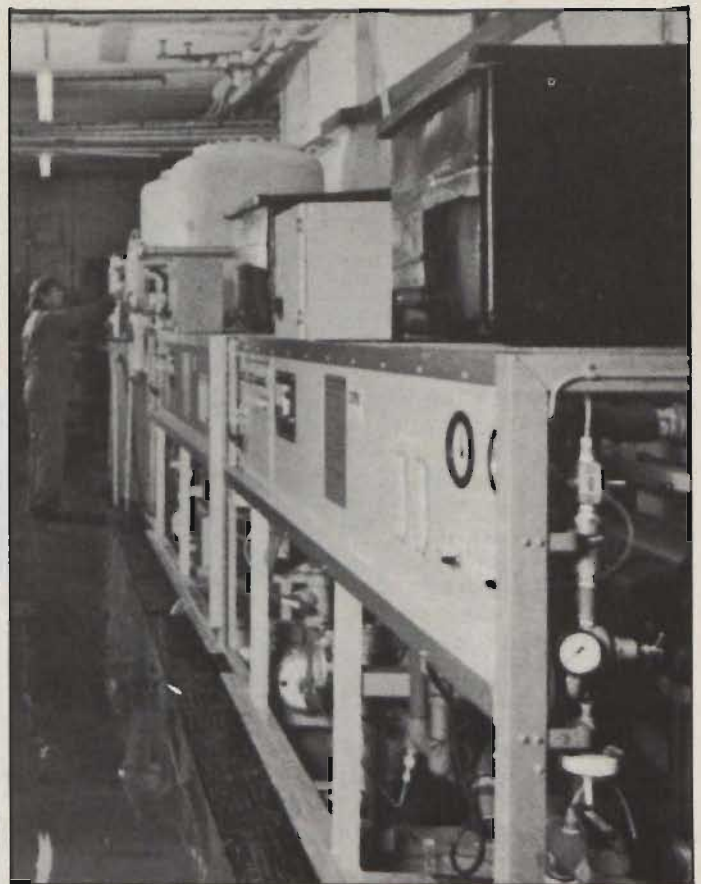
For technical literature or further information on water treatment contact R. S. White Ltd., The Crescent, Donnybrook, Dublin 4, Phone 693144 Telex 33301.

## *Storage Tanks of Ireland*

Storage Tanks of Ireland is run by Alec Florence and Sean Doyle who claim that theirs is the only Irish company solely involved in supplying storage tanks and able to offer their clients a full design service and engineering back-up.

The company handles the following ranges of tanks which incorporate all the most advanced design features and coatings:-

Vulcan Tanks are cylindrical, bolted and sectional, and available in either vitreous enamelled or galvanised finish with capacities from 1,660 to 900,000 gallons. They are approved for F.M. and F.O.C. standards and widely used for sprinkler fire protection systems. These tanks are in use by county councils for town supplies in Cork, Mayo, Donegal, Galway and Wexford and are widely



● Permutit water treatment by reverse osmosis and ion-exchange for micro-electronics production.



● The pumping and cooling module from the Water Saver Systems  
Published by ARROW@TU Dublin, 1983



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specified by engineers.

N.E.I. Horsely Bridge Hydrostor G.R.P. Sectional Tanks. Horsely Bridge have been in the business of providing sectional tanks for storing water and other liquids for over 100 years. The tank panels are hot press moulded and the product quality has been accepted by the National Water Council among many. Capacities range from 300 to 1,000,000 gallons.

Hydrostor G.R.P. sectional tanks are the only tanks supplied in Ireland with stainless steel nuts, bolts and washers as standard items — and an integral part of the maintenance free concept of the tank.

Decca Plastics fill the requirements for the smaller tanks with one-piece mould G.R.P. tanks from 100 to 2,000 gallons. They have a longer life than copper or galvanised tanks and are light, tough and hygienic.

Storage Tanks of Ireland Ltd., Coolock Industrial Estate, Dublin 5.

## Elga Water Treatment

Utilising the theory of reverse osmosis and applying it carefully, water purification specialists, Elga Water Treatment Ltd. of Malahide, Co. Dublin, and a member of The Elga Group of Companies, offer a range of reverse osmosis plants which are used extensively for the treatment of boiler feed water.

Elga's range of Intercept RO reverse osmosis plants are able to produce up to, and in excess of, 20 cubic metres (4,500 gallons) of treated water per hour and the electrical running costs of these plants work out to be approximately 10-11p per 1,000 gallons of water treated. This figure is based on the used paying in the order of 1p per kW.

In view of the reduced blow down frequency, reduced internal chemical treatment and, less

effluent, reverse osmosis seems the next logical step in the treatment of boiler make-up feed water.

Further details from: Elga Water Treatment Ltd., 11 James's Terrace, Malahide, Co. Dublin. Tel: 450135/450666. Contact: Mr. P. Archer, General Sales Manager.

## Whessoe Limited

Whessoe have recently completed the fabrication and erection of 59 tanks for the Alcan site at Auginish Island in the Shannon estuary, Co. Limerick, of which an interesting feature is the variety of tank sizes and construction procedures used. On 16 filter tanks, for instance, the requirement was for fabrication and trial erection at the Finglas Works of the seven metre diameter x 7.5 metre high vessels, followed by the dismantling, shipment to site in acceptable sizes where they were reassembled, welded and tested.

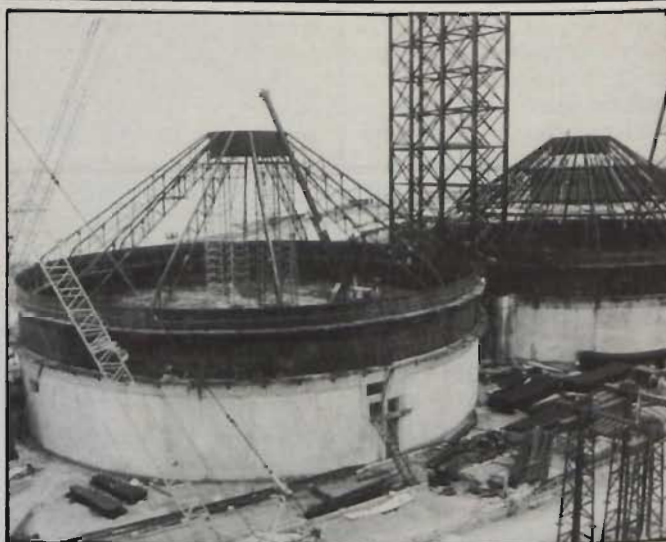
For three alumina bins, 42 metres in diameter and 31 metres high the construction was on a seven metre high reinforced concrete plinth using the now familiar jacking method to erect.

The jacking method was also employed for the erection of two caustic storage tanks 27 metres in diameter x 15 metres high.

A total of 5,300 tons of steel was used in this contract which was awarded to Whessoe (Ireland) Limited by Alumina Contractors Limited.

## Hanovia Systems

Hanovia has launched a new range of packaged water disinfection systems, with full automatic monitoring the control, based on the latest



● Alumina bins, 42m dia. x 31m high on a 7m high reinforced concrete plinth, during construction by the factory method by Whessoe (Irl) Ltd. for Alumina Contractors Ltd.

developments in ultraviolet photoreactor technology.

Exceptionally low running costs and unusually high confidence in disinfection effectiveness are the key features of these advanced sterilisers. Running costs are said to be as little as 0.25p (a quarter of a penny) per cubic metre of water.

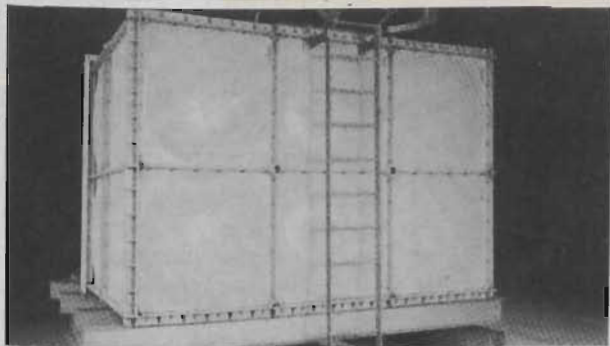
Hanovia's new sterilisers claim to kill all types of waterborne microorganisms, including

the smallest virus, with a kill factor greater than 99.99 per cent.

Four systems are currently available with treatment capacities of up to 1.4, 12, 34 and 90m<sup>3</sup>/h, though higher flow rates can easily be treated by using several units in parallel. Power consumption is modest, ranging from 150W for the smallest unit to 2.5kW for the high capacity model.



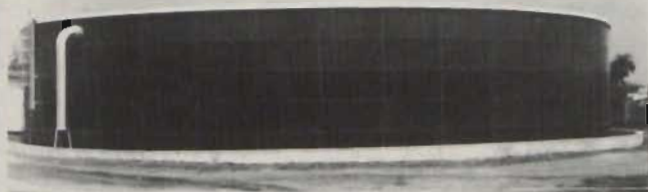
● Hanovia's new water sterilisation systems consume very little power and disinfect drinking or industrial process water remarkably cheaply. Ultraviolet light is used to destroy bacteria, viruses and all microorganisms without resort to chemicals, filtration or heat treatment.



N.E.I. Hydrostor G.R.P. Sectional Tank — Capacities from 1000 Litres to 4.5 million Litres.



Decca Plastics One Piece G. R. P. Tanks ex stock. Capacities 100-2000 Gallons corresponding to Galvanised Tanks



Vulcan Vitreous Enamelled and Galvanised Tanks. F.O.C. and F.M. Approved. Capacities 10 Cubic Metres-5000 Cubic Metres.

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## Compressed Air and Energy Conservation

● Continued from page 11

### Test procedure

● Switch on compressor and observe time it takes for pressure in receiver to climb from zero to working pressure.

### Test evaluation

● Ideally, this test should be carried out when the compressor is new or just after an overhaul and the pump up time noted for future comparisons. This time can then be compared with that actually obtained in future and if a significant discrepancy exists then reasons should be sought: Leaking valves, worn piston rings, clogged coolers, clogged filters, loose drive belts, etc.

● If the above comparison is not possible then some indication of the unit's performance can be obtained by comparing the test results with typical values for the type of compressor concerned.

In this case the time should be recorded for the pressure in the receiver to rise from  $P_1$  to  $P_2$ . The values obtained should then be inserted in the following formula:

$$V(P_2 - P_1) \\ P_0 \cdot T \cdot kW$$

$V$  = Volume of receiver (litres).

$P_1$  = Atmospheric pressure  
= (1.013 bar absolute)

$P_2$  = Initial receiver pressure (bar absolute).

$P_0$  = Final receiver pressure (bar absolute).

$T$  = Time taken in seconds.

$kW$  = Compressor motor rating expressed in kilowatts.

The value obtained from the above formula should then be compared against the values shown in Table A which are the best that are likely to be obtained in practice.

● Whenever possible the intake ducting for an air compressor should be run to the outside of the building. Since the average outdoor temperature is usually well below the air temperature in the compressor house it is worthwhile to consider taking cool supply air to the compressor from outdoors. The

The following is a summary of a paper entitled "Shell Boilers and Coal Firing in the Eighties" presented at a recent function held by Heating Controls & Devices Ltd and B&E Boilers Ltd.

The revised U.K. shell boiler standard, BS.2790:1982 published in October, is largely compatible with new international draft standards for shell boilers in the development of which the U.K. delegation have played a leading part. Extensive technical changes have been incorporated, including limits on heat input to furnaces, methods of calculation and limitation of metal temperature in critical components and updating of quality control requirements, all in the interest of safe and reliable boiler operation.

The presentation illustrated some aspects of boiler design which cannot be covered by code rules. For example, to ensure correct matching of firing equipment the boiler designer requires a sound knowledge of the many different types of burners and stokers and their compatibility with the wide variety of available fuels.

The effect of fuel and firing equipment on boiler design is shown by the extent of derating necessary to burn coal in boilers originally designed for oil fuels or gas. The output with coal is often limited by consideration of fused ash fouling, it varies widely and can be as low as 25% of the oil fired rating; depending on boiler size, coal rank and grading, swelling number and ash characteristics, and on the firing equipment suitable for the coal.

It was shown that the overall thermal efficiency of modern purpose designed coal fired plant can be very close to the oil fired efficiency for the same duty. A



general description of the nature of coal as a boiler fuel was included together with the various types of firing equipment and combustion processes including the well established underfeed, chaingrate and coking stokers and the more recent development in coal firing systems suitable for shell boilers.

Typical installations showing the application of modern coal and ash handling systems were illustrated by slides and the subsequent discussion indicated a wide interest in changing to coal.

The present is an opportune moment to seriously consider the installation of new plant for coal firing since the real price differential between oil and coal, ranging from 8 to 20p/therm, and the availability of capital grants are financially attractive. Careful study is required for each individual applicacase studies indicate that cost effective schemes are possible for a wide range of duties and plant sizes. Payback in 2 to 3 years is not uncommon and less than 2 years has been possible in a number of cases.

Also, the developments in pneumatic coal and ash handling can provide plant which is as clean and simple to operate as oil fired installations. The old image of dirty conditions due to coal dust and ash



● Mr. Dennis Kenyon, Managing Director of Trianco Redfyre Ltd.; Mr. Fred Medicott, Technical Training and Liaison Manager; Mr. T. Mustard, Regional Technical Manager and Mr. M. Fowler, Executive Sales Director.

is rapidly disappearing.

An initial £60,000 export order for the energy-saving Aerocowl combined flue terminal and ventilator has just been shipped to America by Aerocowl Marketing Ltd. This follows an extended and highly successful market research and sales visit made to the United States in September by the company's Managing Director, Noel Hawkes.

Such is the confidence of the American importers, Meehan & Company of Clarkesburg, Massachusetts, that they are establishing a new company, Aerocowl USA Inc., to handle sales of the product throughout the States.

Commenting on this order, Noel Hawkes said that it represented a major achievement in penetrating a very difficult but colossal market.

"Gone are the days of the theory that one needs only pack a product in plastic bags for the Americans to buy by the millions. Today, the market must be researched, and the product must not only fulfil a need but also be properly merchandised. In other words, it is necessary to sell a complete package."

Mr. Hawkes also acknowledged the assistance given by the Northern Ireland Department of Commerce in making the American trip so successful.

For a week the Kings Hall, Belfast, was converted into a "fairyland" for the Building, Engineering & Home Heat Exhibition (see pictures).

Thousands of visitors inspected the exhibition of stands of the highest quality displaying on the luxury of wall to wall carpeting.

The latest bathroom suites, showers, jacuzzis and sanitary ware were on show. The use of colour, coupled with ceramic coated taps and motorised showers seemed to be the new innovation.

Manufacturers of heating equipment from all parts of the world had a hall to themselves. Ian Keinohan showed the now Rayburn cooker, John Kelly Ltd. the new Stato water heater, the N.I.E.S. had a new electric central heating boiler, Trianco their new range of boilers to mention but a few new products on show for the first time.

The exhibition was organised by W.H.C. Industrial Promotions Ltd. and the Home Heat Section was Published by ARROW@TU Dublin, 1983



● Pictured at the Thorn EMI Heating Ltd. seminar held in the La Mon Hotel to introduce the Apollo wall hung gas boiler now suitable for propane gas from left to right are Mr. E. White, Northern Service Manager; Mr. M. Green, Chief Technical Representative; Mr. Philip Johnston, Area Sales Manager and Mr. T. Gate, Sales Marketing Director for Calor Kosangas Ltd.

sponsored by the Institute of Energy.

G. A. General Works Ltd., Boucher Road, Belfast, have been appointed agents and installers for Waltherm cavity dry fibre wool insulation.

The Cawood Group has announced a restructuring of its Belfast Board following its take over by the Redland Group. As a result Mr. Charles Neill becomes Chairman of Cawood, Northern Ireland, with Mr. E. Priestly as Managing Director.

The main board will be Mr. D. Lyon, Mr. J. Lisher, Mr. J. Irwin, Mr. E. Gaynor and Mr. D. Myles with the company divided into a series of trading units representing their coal, oil, shipping and building merchant interests.

Alpha Controls the Belfast based control equipment firm have appointed two new directors, Mr. Michael Coady who will be responsible for design and manufacture and Mr. J. Rogers who will be in charge of sales and service in Northern Ireland.

The present directors are Mr. Ronnie Foreman as MD and Mr. Martin Foreman.

Worthington Simpson Ltd. the internationally known pump manufacturers have advised us that they have appointed as their Northern Ireland Agent Mr. Maurice McCullough, 61 Oakland Avenue, Belfast, Telephone 657370.

The death has taken place of "Tommy" Green, late of Esso Ltd., after a short illness.

To his wife, we express our sympathy.

Willis Heating and Plumbing Co. Ltd. of Belfast have just begun to distribute Jetfreezer Pipefreezing Equipment. This remarkable maintenance tool can save time, and hence money, when changing valves

or undertaking pipework repairs.

Instead of draining down a large water-filled installation, with Jetfreezer you simply freeze the pipe each side of the faulty item. The ice plugs formed within the pipe isolate the pipe section, allowing maintenance work to proceed unhindered. When the job is finished, the Jetfreezer jackets are removed from the pipe, and within a few minutes the ice plugs melt. The pipe is not damaged in any way. With Jetfreezer, the whole job takes only minutes, as opposed to hours when the installation has to be drained down, refilled and the air locks vented.

Jetfreezer can freeze pipes of up to four inches diameter, using a series of special nylon freezing jackets. A medium sized Jetfreezer kit, for double freezes on pipes of up to 1½ inches diameter, costs around £200.00, plus VAT. The kit can pay for itself within a few jobs. Plumbers, heating engineers and maintenance men have found that Jetfreezer is an invaluable addition to their tool kit.

The manufacturers, Distillers CO<sub>2</sub>, sell Jetfreezer in some 16 different countries throughout the world, including the USA and Japan. They estimate that about one-third of the plumbers and heating engineers in England now own a Jetfreezer kit, and even higher market penetrations have been achieved in key export countries such as Sweden and Switzerland.

Until now Jetfreezer sales in Northern Ireland have been few. But Willis Heating and Plumbing Director Harry Pettis reckons that Jetfreezer will catch on here as well. He has been using a Jetfreezer himself for several months and is delighted with the results. Further information on Jetfreezer is available from: Willis Heating and Plumbing Co. Ltd., 25/27 Dublin Road, Belfast, BT2 7HT, Telephone: Belfast 27359.

## Technical Paper

Paper presented for the Munster branch of the IDHE by W.J.R. Couchman, Technical Director, Multifuel Heaters Ltd.

There is nothing new in the use of solid fuel within a boiler. Large houses were being heated with cast-iron sectional boilers and complex gravity systems almost a hundred years ago. The brilliantly designed pressurised Perkins system, usually known in this country as the Musgrave system, was patented by Jacob Perkins in the 1830s. One still sees the occasional country church with remains of these systems. Moving closer to our own times, we are too ready to forget that the research, development and training work on the small central heating system in the late fifties was carried out by the solid fuel industry. Two organisations, both now defunct, the British Coal Utilisation Research Association and the Coal Utilisation Council (with whom your speaker had the privilege to serve until 1959) were responsible for domestic heating as we know it today. In 1960 the major oil companies jumped on the bandwagon and the rest is history. Included in that history is the oil crisis of 1973 with ensuing cost escalation and recurring uncertainty of supply. This is why there must be a heavy emphasis on solid fuel, in any current discussion of domestic heating. We should be very thankful for natural gas, yet another blessing to flow from Munster, but it would be a mistake to believe that the Government can afford the sale of gas at bargain prices in these times. It would also be a mistake to believe that the existing gas grid would ever be extended to cover every town in Ireland.

If there is nothing new about the use of solid fuel for domestic heating there certainly is a great deal that we seem to have forgotten. Many

# Pipework Design for Solid Fuel Heating

householders have forgotten — if they ever knew — that chimneys and flue-ways need regular cleaning and that ash will choke a fire and put it out if it is left to accumulate. To say nothing of the damage that the notorious “fire sandwich” can do to the firebars. Many of us forget that a solid fuel appliance is only as good as its flue, which is not the subject of this discussion although it fascinates. It is also easy to forget that a solid fuel appliance is controlled on a high output/low output basis rather than an on/off basis as is the case with gas, electrical and nearly all oil heating appliances.

The high/low factor means, in practice, that provision must always be made for the dispersion of a certain amount of heat without the use of a circulating pump. A small domestic heating appliance might have an absolute minimum heating rate of three quarters of a pound of coal per hour. Allowing for reasonable efficiency, this means an input of about 6,000 Btu/h or a little less than two kilowatts. If this cannot be dispersed then the water will boil. In practice it is usually necessary to allow for more than the minimum burning rate. This is because the effect of cutting it out with a lively fire burning, is to throw a great deal of heat, quite suddenly, into the gravity circulation. The amount of heat involved will be far in excess of the minimum burning rate. If the appliance has a thermostat, then this will gradually reduce the burning rate although it may take anything up to twenty minutes for the

output to settle down at a reduced level. There are still many manually controlled solid fuel appliances and these, of course, will carry on producing heat just as if the pump was still working.

There is a tendency to treat the hot water cylinder as a sufficient “heat leak” to deal with the situation described in the preceding paragraph. This is often thought to be good enough for a high-output back boiler, which seldom has an output to water in excess of 25,000 Btu/h, or just over 7 Kw (There has been a number of instances lately of manufacturers claiming output far in excess of this figure but these claims are false i.e. they are unsubstantiated by any IIRS or C.R.E. test figures). Even with a back boiler it is better to have at least one reasonably-sized radiator on a gravity “heat-leak” circuit, larger boilers may well require more than one radiator. The fact is that a domestic hot water cylinder is not really good enough as a heat leak for even a small boiler. If the cylinder is already hot, what further heat transfer can take place? Even if the cylinder is cold the internal heat transfer surface may be so small that the rate of heat exchange may be far too slow. It seems to be standard practice for the small indirect cylinder, at least in this country, to be made with a 3/4 inch coil. Incidentally this is not an excuse to reduce the primary flow and return below one inch.

There must, inevitably be occasions where the heat leak is insufficient. What then? The first thing that will happen is that the

system will boil. If there is no dispersal of heat, apart from heat losses from pipework, then a small domestic system that is already up to working temperature may need only three or four Kw to bring it to boiling point. Say one and a half to two pounds, or a kilogram of coal. Once boiling has actually started the capacity of the system to absorb heat is very greatly increased. It takes almost ten times as much energy to evaporate water by boiling as it does to heat it up to boiling point. Provided therefore, that there is an open vent, not less than 1/4 inch together with a separate 1/2 inch cold feed there will be no further problem with the system. It will boil away until the fire burns out. There will, however, be a problem with the user. When a domestic heating system boils it can be extremely noisy. The sharp percussive sounds of steam bubbles forming and collapsing in the top of the boiler, the rumbling of steam passing up the vent-pipe, and the volumes of steam in the roof space — all these things will terrify the average housewife. It is clearly a situation to be avoided.

There are situations where boiling can be extremely dangerous. Once such is where the cold feed has been branched into the vent. When a combined feed and vent, i.e. a single pipe is used to serve simultaneously as a vent for fast-moving steam and an inlet for replacement water trouble is almost sure to follow. This has been proved by field experience and also by tests carried out by this Institute some five or six years ago. Typically the

boiler steams until little or no water is left in it. At this point the boiler walls may be almost red hot. Eventually the pressure in the vent reduces to a point where cold water can enter from the feed and expansion tank. As this water enters the boiler it may flash immediately to steam, rupturing the boiler and, quite possibly, distributing burning fuel from the appliances. This has happened often enough for it to be recognised as a serious risk.

Another, very dangerous, situation can arise where no possibility of gravity circulation exists for a solid fuel fired boiler. Sooner or later the pump will fail. It will wear out, or burn out, or there will be a power cut or a fuse will blow. What then? Steam will accumulate in the top of the boiler, forcing water downwards and outwards, leaving the

boiler dry. This time there will be no ingress of cold water. Instead the boiler may become red hot when it will either distort and fracture, or, quite possibly start a fire. This has happened within your speakers experience. It happened when a boiler was fitted in a kitchen with adjoining fitted cupboards and the flow and return pipes taken from the boiler to a level below the floor. Another instance of this sort of arrangement is the quite common one of the boiler sited away from a dwelling with underground flow and return pipework.

Continuing on the theme of safety, reference is made to the IIRS publication "A Guide to the Installation of Solid Fuel Heating". This gives invaluable and concisely written advice, as well as referring to the relevant official standards. Reference is also made to the invaluable work carried

out by H. C. Maguire, a distinguished former president of the National Branch of this Institute, on the interlinking of two domestic boilers on the same system. Many attempts have been made to modify or change Hugh Maguire's original work but no satisfactory substitute has been found for his basic arrangement involving two cylinder coils, two vents, two feeds, two pumps, and separator by valves of the connections to the radiator currents.

Much may be said on the possibilities for pipework arrangements and control specifically for solid fuel systems. The combination of a pumped ground floor circulation and a gravity first floor circulation, using a control system that gives preference to one floor or the other, depending on the time of day, has a great deal to commend it.

The control system originally devised by the BCURA utilised a mixing valve, controlled by the external temperature, to keep the system at a temperature appropriate to the conditions. With solid fuel it is even more important that the performance of the system should not be left to the appliance thermostat alone.

Finally, may the point be made yet once more that it is incumbent on all of us that are professionally employed in the heating industry, and most of all those of us that are Institute members, to do all we can to raise installation standards. Until we get rid of "cowboy" part-time workers and other irresponsible so-called installers the public will never be assured of the standards of heating that they deserve.

**CIBS NEWS • CIBS NEWS • CIBS NEWS • CIBS NEWS • CIBS NEWS • CIBS NEWS**

## CIBS TECHNICAL EVENING

The CIBS held a very successful technical evening on the subject of Computers in Building Services — Users Experiences. The venue was College of Technology Bolton Street, Dublin and the panel of speakers included Mr. Patrick Ryan, Varming Mulcahy

Reilly Associates; Mr. Russell Lawlor, J. N. & G. Traynor and Partners; Mr. Martin Kennedy, Abigkail, Consulting Engineers and Mr. Alan McGloughlin, P. J. Reilly & Co. Ltd.

The speakers discussed their experiences as users of computers in the Building Services Industry.



● Pictured at the CIBS technical evening were the speakers Martin Kennedy, Alan McGloughlin, Pat Ryan, and Russell Lawlor.

### Forthcoming CIBS Events:

- 20 January 1983 — Evening Technical Meeting (to be held at An Foras Forbartha) "The Practical Application of New Lighting Developments" and "Electricity Tariffs & Metering"
- 16 February 1983 — CIBS Annual Symposium "Computers & Building Services" (at IHVEX Exhibition, RDS)
- 18 February 1983 — Annual Dinner, Shelbourne Hotel
- Student's Awards — The annual CIBS Student's Awards are sponsored by TCS Ltd. and prizes are to be given for the best three papers on any aspect of Building Services.  
 First Prize — Expenses-paid trip to CIBS Technical Conference at University of Reading  
 2nd Prize — £100  
 3rd Prize — £50

The CIBS wishes to thank Mr. Gerry Curran of TCS Ltd. for his sponsorship.

The Committee of the CIBS wish all members and friends a happy and peaceful New Year.



**NEW PRODUCTS**

# Effective Ventilation from Aidelle

Aidelle offer a full range of extractor fans which incorporate powerful centrifugal impellers to allow maximum flow of air against high system resistance.

Aidelle Loovent extractors are specifically designed for toilets and bathrooms. Seven models are available with different operating and switching mechanisms including versions with built-in timers. The new design of the small Loovents incorporates various modifications to improve installation, efficiency and servicing. The larger models are capable of extracting from two adjoining rooms simultaneously and may be fully recessed on walls or ceilings to be totally unobtrusive.

The Aidelle Wallfan 6 extractor, suitable for domestic kitchens, laundry



● Aidelle Loovent Model 01 for really efficient ventilation.

rooms, etc, incorporates two powerful centrifugal fans. It has a two-speed motor controlled by a three position wall-switch and can be fully recessed or surface mounted on walls or ceilings. The modular design and plug-in connections make installing the Wallfan 6 fast and simple.

For large kitchens, reception rooms and

commercial applications, the Aidelle Wallfan 9 is a highly efficient extractor. The unit is fully recessed into the wall or ceiling so that all that can be seen is the attractive louvred grille. Wallfan 9 is designed for ease of installation and combines high performance with low noise levels.

Details from McKenna Ireland Ltd.

de-ashing the fire with the door closed, making for a dust-free operation.

The glass fronted fire-door has an "up and over" movement allowing it to be conveniently parked out of sight behind the canopy, giving the maximum access for re-fuelling. This features also provide an unobstructed view of the burning fuel when the stove is used as an open fire.

Two versions of the "International" are available: a boiler model with thermostatic control for central heating, 33,500 Btu/hr to water, 11,500 Btu/hr to room, and direct room heating in addition to domestic hot water, and a dry refractory lined version is available with manual air control for direct space heating of up to 7,500 cu. ft.

A rear and top outlet is provided to allow the stove to be fitted in a variety of installation arrangements.

Easy access is provided for chimney sweeping through the stove whether the flue off-take is from the top or rear. A special optional flue bend is provided for the rear connection to ensure ease of sweeping.

The "International" is constructed from heavy gauge welded steel plate to the relevant British Standards and this, together with robust internal components and chrome iron fire-bars, ensures a very long and trouble free life for the stove.

Details from Heating Distributor Ltd., 145-147 Richmond Rd., Dublin 3, (Tel: 375144/5).

## SALES ENGINEER

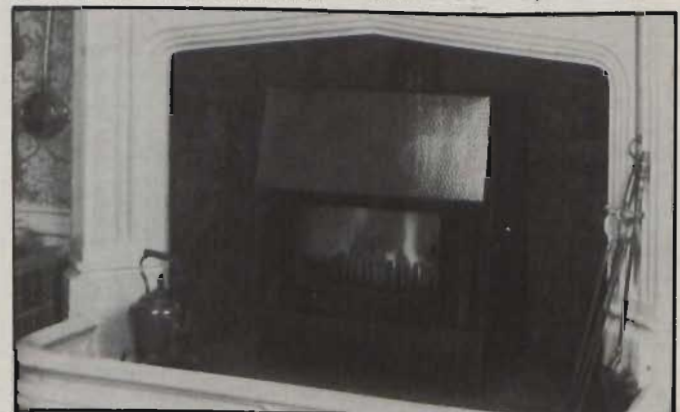
Excellent opportunity for an experienced sales engineer to join a new air filter sales and service company covering all Ireland. A knowledge of basic acoustics would be an advantage.

Interviews in Dublin or Belfast.

Reply with full details to **BOX IHVN6**

## TRIANCO LAUNCH MULTI-FUEL STOVE

A simple lever movement converts the grate from a slotted coal fired grate to a closed wood burning bed, whilst simultaneously re-directing the combustion air from under the fire for coal burning to over the fire for wood. The same mechanism is also used for



● The new Trianco International multi-fuel stove from Heating Distributors Ltd.

**NEW PRODUCTS**

**MAINMET HEAT METER**

Mainmet (PEC) Limited, the Bradford-based company specialising in services to the communal heating market, has introduced the first integral prepayment heat controller (PHC) and debt recovery system designed for use on communal heating schemes.

One of a new family of Prepayment Energy Controllers developed by the company in conjunction with Hawker Siddeley Revenue Controls Limited, the Prepayment Heat Controller provides a secure, reliable and versatile modern version of the traditional coin-in-the-slot type of prepayment meter, widely used by the energy supply industries.

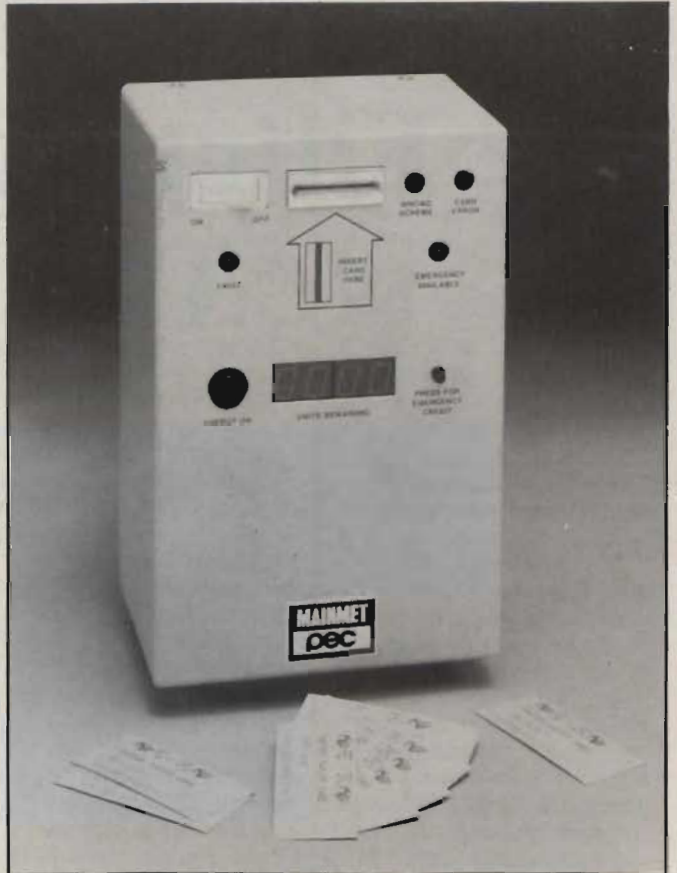
Comparing a controller, a heat meter and interruptor valve, which are fitted into the heating system, the PHC is simple to install and operate, providing a means for scheme operators to fully control and debt

problems while also offering a simple budget payment method for consumers.

The principle behind the system is that the consumer purchases a special card, equivalent to a number of units of energy (Kwh), from the scheme operator. This card is then fed into the controller, located with in each dwelling, which records the credit value of the card.

Up to this point clear similarities can be drawn between the operation of the PHC and coin-in-the-slot prepayments meters used by the electricity and gas supply industries. However, where the PHC differs is in its use of modern technology to provide improved security and credit control.

Full details of the Prepayment Heat from Mainmet (PEC) Limited, 1/3 Station Road, Cullingworth, Nr. Bradford, West Yorkshire.



● The new Prepayment Heat Controller from Mainmet (PEC) Limited.

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# Filtering Through The Media

The following are brief definitions of the various types of filters.

**Air Filter** Assembly of dust-, gas-, or dirt-absorbing surfaces fitted into a ducted system to clean the air passing through it. The filter sheet metal housing is usually provided with flanges for attachment to ductwork. There are many types of filter and filter media to suit the various filtration requirements encountered in research and industry.

**Air filter — absolute** Fabric dry-type filter unit suitable for filtration at ultra-high efficiency down to 0.01 micron particle size. Will remove dust, bacteria, virus concentrations, etc. Employs as filtration medium a special form of glass-based paper containing a proportion of finely corded, long asbestos fibre or similar material.

**Application:** hospital, clean room, research, etc. situations.

**Air filter — bag** Comprises a series of filter bags within the filter assembly. Can be made to provide a high-filtration efficiency by suitable specification of filter medium. Can incorporate automatic dust-shaking device. Can handle large dust load.

**Air filter — ceramic** Used in the removal of acid mists and in compressed air filtration. Suitable for use on high-pressure and high-temperature applications.

**Application:** (as above). Can be

made suitable to withstand thermal shock.

**Air filter — electrostatic** Has three major components: ionizer, dust collector and electronic power pack. Ionizer comprises a series of earthed tubes; between adjoining tubes is stretched a fine metal wire charged to about 13,000 V direct current (dc). When the ionizer wire is charged positively, the amount of ozone present in the filtered air is not increased beyond that found in the atmosphere at sea level on a normal sunny day.

A strong electrostatic field is set up across the space between the ionizing wire and the earthed tube surface, and, at the correct voltage, a corona discharge takes place from the wire, causing ionization of the air molecules, which are thereby greatly accelerated. When a dust particle carried by the air stream passes through this space, it is met by a stream of ions travelling outwards from the ionizing wire. Collision with this stream ionizes the dust particles and causes these to become impelled in the direction of the collector cell, which consists of a number of flat, parallel, vertical plates; one set is earthed, and the second set charged to approximately 6000 V. The plates are arranged alternately so that the air and the dust flow along narrow passages with an earthed plate on one side and a charged plate on the other. The electrostatic field between the plates in the collector cell draws the

dust particle to the earthed plate, to which they adhere until removed.

Cleaning of the electrostatic filter is carried out by washing down the cells with warm water; it is often found convenient to install sparge pipes for this purpose. The permissible length of time between cleaning operations depends on the location of the plant, the proportion of air recirculation and the season of the year (much more frequent cleaning than normal would be required during periods of a heavy London fog).

Sumps with adequate drain connections and water seals must be provided, the object of the seals being to prevent ingress of unfiltered air via the drains. Man-access to the filter is through air-tight doors with safety locks, inter-locked with the power pack to prevent opening of the access doors unless the electric supply to the filter unit has been switched off.

**Air filter — fabric-type** Uses a fabric filtration medium (as opposed to liquid, metal, etc). Suitable for filtration down to 2 micron particle size. Material must be suited to the application and may have to be flame and fire resistant in certain instances.

**Air filter — gauge** Indicates filter resistance. Can incorporate warning lights.

**Air filter — grease filtration type** Used in conjunction with cooking and similar equipment which generates suspended

grease. Is usually located at the outlet(s) of the exhaust canopy where this connects with the extract ducting. Filter cells are usually provided with means of easy handling and withdrawal for cleaning in suitable detergent solution and re-use.

**Air filter — pre-filter A** course type of filter used ahead of main filter. Essential to protect absolute, carbon and electrostatic main filters; otherwise employed where dust burden is great.

**Air filter — renewable-type** The filter medium may be cleaned by compressed air or vacuum, or it may be a viscous liquid which is recycled through a suitable liquid cleaner.

**Air filter — roll-type** Filtering material is wrapped around a drum which automatically advanced to maintain an acceptable clean surface of filtration medium. An end-of-roll warning alarm or light indication must be provided to alert the maintenance staff to the need for roll replacement. Tends to provide relatively course filtering.

**Air filter — throwaway-type** The filter medium is expendable. When saturated with the filtered material or when its resistance has become excessive, the material is removed, thrown away and replaced with new. The filter casing must have facilities for monitoring filter performance and must be provided with means of easy withdrawal.

# NEW MAKE UP AIR UNIT FROM ITT REZNOR

A direct fired make up air unit from ITT Reznor, the DFMA 10, is proving the ideal solution to problems of ventilation in contaminated atmospheres. A comfortable working environment can be achieved using the DFMA unit, as it replaces extracted air containing contaminants and toxic fumes with fresh air from outside. The stream of incoming air passes directly over a gas burner, giving the additional benefit of a highly efficient heating system if required.

Many industrial processes, including metal plating, spray or dip painting, chemical treatments, commercial kitchens and garages, which require the exhausting of air contaminated with dust, toxic fumes, vapours, etc., can benefit considerably

from the installation of a Reznor direct fired make up air unit.

The absence of make up air may cause an exhaust system to operate inefficiently, or negative pressure may build up within the building, allowing air and dust to enter through windows, doors and cracks, increasing contamination in the atmosphere, which can lead to inefficient production.

The DFMA 10 unit constantly supplied fresh air from outside into the building, using twin centrifugal blowers driven by an electric motor. Filters and dampers are available as options. The considerable dilution of the burnt fuel which takes place in the unit ensures that the concentration of combustion products introduced into the

building are well within the limits allowed, making the system absolutely safe for personnel and industrial processes.

Immediate start-up modulating gas control minimises gas input and lowers fuel bills, making this an economical method of heating — a feature which has been recognised by satisfied users.

Modular construction and carefully engineered design make a Reznor direct fired make up air unit a money saver and a reliable piece of equipment for a combination system involving both ventilation and heating.

produces economies both in cost and floor space required.

CP (Compactos) units employ the same basic principles as other Powrmatic heaters, and provides highly efficient appliances that take up a minimum of floor space.

There are six CP models, all upright, offering heat outputs of 100,000, 150,000, 200,000, 500,000, 800,000 and 1,000,000 Btu/h. You can specify either free-blowing or ducted operation.

All CP units are supplied with a Powrtrol control box. This incorporates a time clock and room thermostat for fully automatic operation.

An additional standard item is the fan and limit thermostat with normal over-ride switch. In Summer this over-ride switch allows re-circulation of cool air.

Spares are readily available and there is an in-depth service back-up right across the country.

## POWRMATIC LAUNCH CP RANGE

This is the economy range of Powrmatic heaters. It

**AVAILABLE EX-STOCK**

- Propellor Fans
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- Roof Units
- Wall Fans
- Grilles
- Centrifugal Fans
- Fire Dampers
- Window Fans
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With Walker, there's computer matching of your precise needs from the 4,000 Carlyle air conditioning and heating components. It's the only sure way of getting a system that truly meets your needs.

There's the world's biggest range of heat pumps, all engineered for the heat pump market with built-in reversibility to ensure longer life. And the complete range of Carlyle VAV systems – engineered to automatically adjust themselves to the heating or cooling needs of the moment, and in so doing cut your energy bills.

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# HIGH EFFICIENCY SPACE HEATERS

In line with the J.S. Lister policy of purchasing high quality goods of Irish manufacture whenever possible, Hevac Ltd. recently negotiated an exclusive agreement with Thermo-Air Ireland Ltd. for the sale of their oil and gas heaters in the Republic of Ireland.

Thermo air have been manufacturing air heaters in Holland since 1947 and have sales offices in Belgium, West Germany and England. They commenced manufacturing in Carlow in 1981 and demand for their product was such that they added an extension in July 1982.

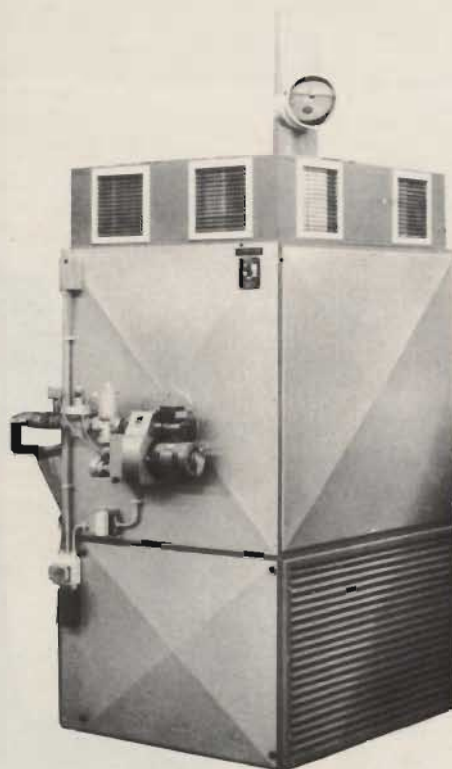
Approx. fifty to sixty 440,000 Btu/h air heaters have been installed in IDA factories at Cork, Westmeath, Dublin, Lough and Galway over the last few months and have been commissioned with an average efficiency of 83%.

Prior to the availability of Thermo-Air heaters virtually all air heaters used in Ireland were of foreign manufacture.

Thermo-Air currently employ approx. 25 to 30 people in the Carlow plant and with a second extension planned for early 1983 this figure is expected to be substantially increased in the near future.

Hevac Ltd. as one of the leading heating distributors in this country are pleased to be associated with Thermo Air Ltd. in marketing the range of quality Irish manufactured air heaters. The heaters were put through a series of exhaustive tests by the IIRS. The tests were satisfactorily concluded on the 2nd of July 1982.

The heaters are high efficiency vertical type gas, or oil fired and are manufactured with



stainless steel combustion chambers and high efficiency fan. The combustion chamber being guaranteed for a ten year period. Model UHR 25 to UHR 250 are manufactured from 80,000 to 1,00,000 Btu/h. Air volume and pressure can be varied to suit specification requirements.

Hevac technical sales are available to calculate building heat losses and offer helpful and technical information regarding the most suitable installation,

location of heaters, ducting arrangements. If required, an after sales service is available to commission and service units.

For further information contact Hevac Ltd. at Lister Complex, Ballymount Road, Clondalkin, Co. Dublin. Phone 519411, Telex 30324. Cork office: c/o Lister Tubes, Tivoli Industrial Estate, Cork. Phone 021-500166 Telex 28408.

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HARRY TAYLOR GROUP PACKAGED COMFORT SYSTEMS SINCE 1925

**IDEAL FOR FACTORIES, GARAGES, WORKSHOPS, STORES, CHURCHES, ETC.**

### MODINE

● Gas fired Unit Heater ● Fast, simple half day installation ● Very low noise level ● Suspends at high level ● Ideal for small jobs.

MODINE	1 heater	2 or more Heaters
60,000 Btu/hr	£ 430.00	£ 430.00
120,000	£ 580.00	£ 531.00
160,000	£ 695.00	£ 648.00
200,000	£ 785.00	£ 750.00
280,000	£ 910.00	£ 837.00

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HEAT REQUIRED IS BUILDING VOLUME IN CU FT x 5 BTU/HR

### WARMCO

● Dual Fuel (Oil or Gas) floor standing heater ● Powerful quiet running fan takes ductwork if req. ● Attractive PVC coated steel cabinet.

WARMCO	1 heater	2 or more Heaters
120,000 Btu/hr	£ 805.00	£ 805.00
200,000	£ 930.00	£ 856.00
250,000	£ 1010.00	£ 930.00
300,000	£ 1060.00	£ 1010.00

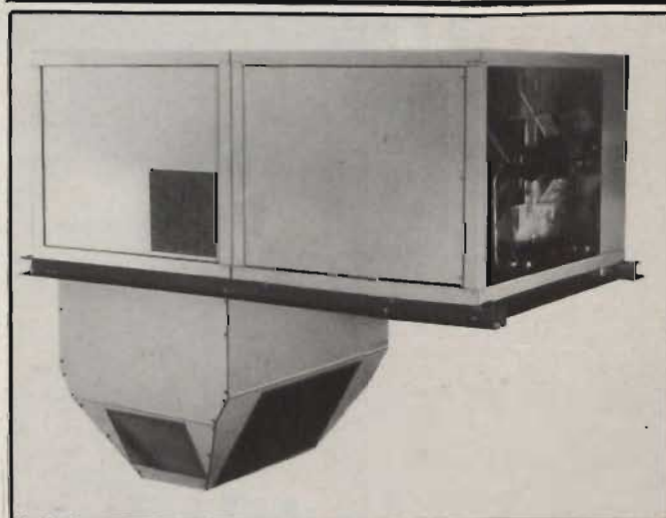
Prices for complete installation on request

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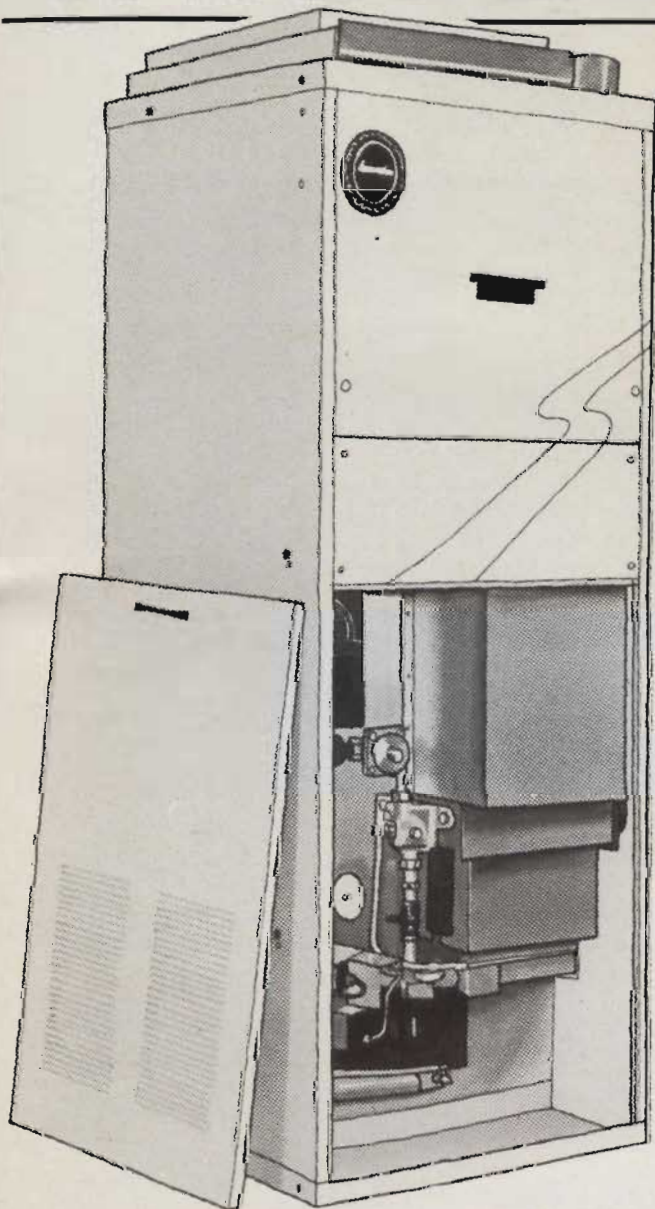
● New DFMA 10 unit from ITT Reznor.

# LINCOLN

# SPARES

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Look no further for spare parts for Lincoln warm air heaters.

If you've been hunting for gas pressure settings, burner injections – or any other Lincoln components – then your search is over.

The entire range of parts for all Lincoln domestic and industrial, oil and gas fired heaters, is readily available from Speedaire and their agents.

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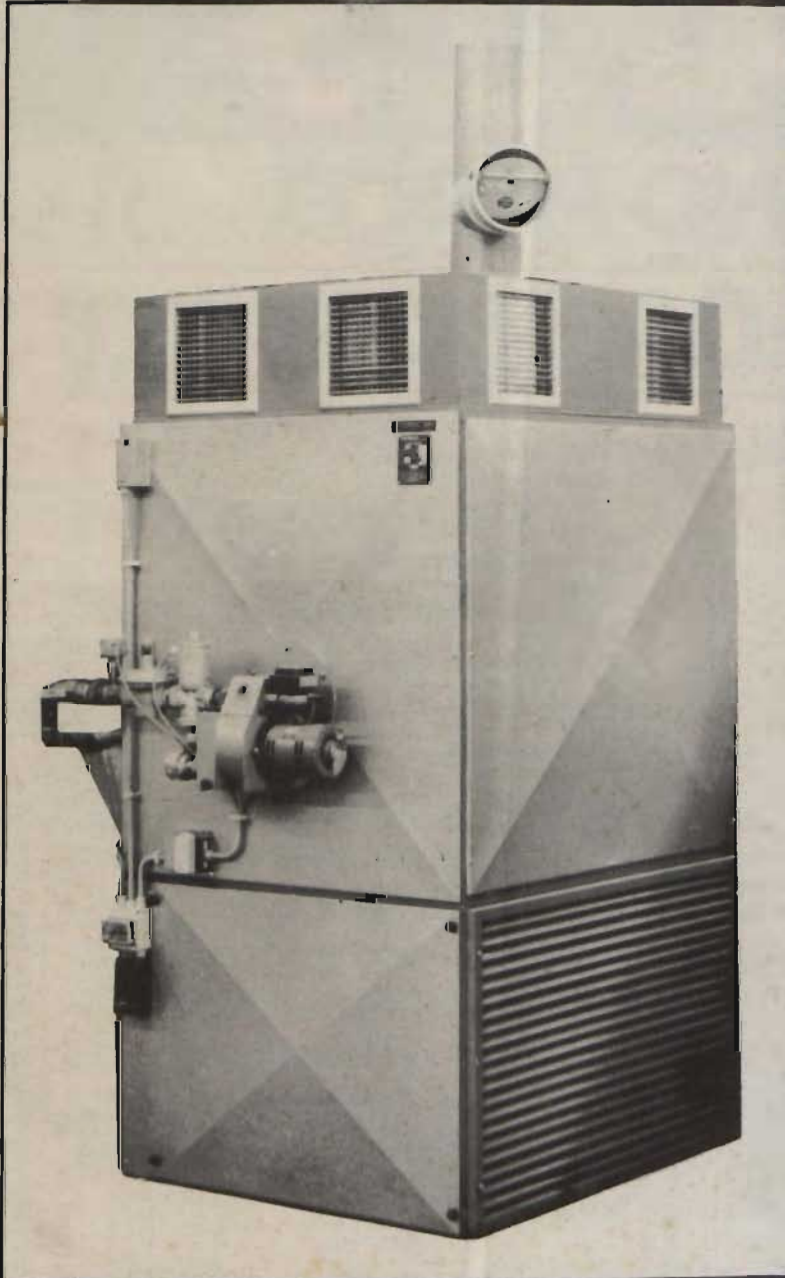
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