

R32 e-series Modular Chiller Range

Project Reference

Manchester Grammar School

Quote Reference

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Prepared By

TC





Important Note

EAHV-M1500YCL(-N)

Air Source Reversible Heat Pump / Chiller

Note: The applications for e-series have been divided into three types: Cooling Only, Heating&Cooling, Heating Only. The Heating Only applications share similar features with the Heating&Cooling applications, except for the total minimum water circulation volume, which differs. In the case of Heating Only, the total minimum water volume has been calculated based on the assumption that for multi-unit systems with more than 6 units, grouping of 6 units method is considered. Please regard this calculation as guidance. For each project involving "Heating Only" applications, the total minimum water volume needs to be calculated. Please refer to the Databook in the following link for this calculation:

https://library.mitsubishielectric.co.uk/pdf/book/DB_MEES23K029_e-series_YCL_JL23#page-1

EAHV-M1500YCL(-N)

Air Source Reversible Heat Pump / Chiller

Design Conditions - Cooling

Outdoor Condition	°C	35
Fluid Inlet Temperature	°C	12
Fluid Outlet Temperature	°C	7
Concentration of Glycol	%	20
Number of Units	No.	2

Total Cooling Capacity	kW	291.3
Cooling Capacity per Unit	kW	146
Input Power per Unit	kW	45
Flow Rate per Unit	l/s	7.2
Pressure Drop	kPa	150.8843

EER	kW/kW	3.26
SEER (See page 3)	kW/kW	5.49
SEER (EN 14825)	kW/kW	5.52

Design Conditions - Heating

Outdoor Condition	°C	-5
Fluid Inlet Temperature	°C	50
Fluid Outlet Temperature	°C	55
Concentration of Glycol	%	20
Number of Units	No.	2

Total Heating Capacity*	kW	199
Heating Capacity per Unit*	kW	99
Input Power per Unit	kW	65
Flow Rate per Unit	l/s	5.5
Pressure Drop	kPa	92

COP	kW/kW	1.54
SCOP (See page 3)	kW/kW	2.54
SCOP Low/Medium (EN 14825)	kW/kW	3.31 / 2.88

*Capacity corrected for defrost



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Refrigerant

Refrigerant Type		R32
GWP		675
Total Charge Per Unit	kg	46
Equivalent CO ₂ Emissions per Unit	kg	31,050

Compressors

Compressor Type	Inverter Scroll Hermetic Compressor	
Starting Method		Inverter
Number of Compressors per Unit	No.	4
Compressor Motor Output (per Compressor)	kW	11.5

Water Side Heat Exchangers

Heat Exchanger Type		Stainless Steel Plate
Minimum Water Circuit Volume per Unit	Litres	1650/850
Total Minimum Water Circuit Volume	Litres	1650

Fans

Fan Type		Propeller Fan
Starting Method		Inverter
Number of Fans per Unit	No.	4
Total Airflow per Unit	l/s	18000
Fan Motor Output (per Fan)	kW	0.92
Available External Static Pressure	Pa	20

Electrical Data

Power Supply per Unit	V/ph/Hz	380-415V/3-phase/50Hz
Max Total Current per Unit	A	120
Starting Current per Unit	A	23.1

Weight

Weight per Unit (with headers)	kg	1307
Total Weight (with Headers)	kg	2614

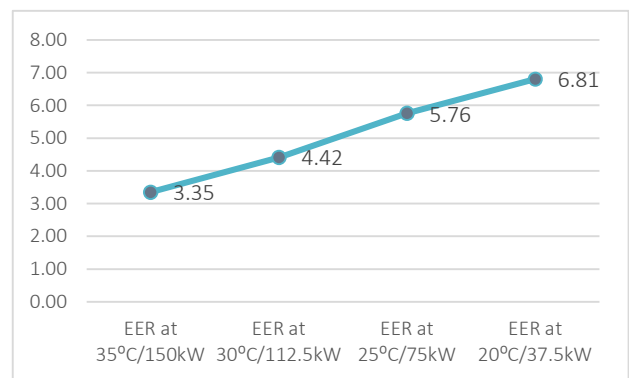
EAHV-M1500YCL(-N)

Air Source Reversible Heat Pump / Chiller

Seasonal Efficiencies - SEER User Defined

Prated,c	kW	150
Fluid Outlet Temp	°C	7
SEER*	kW/kW	5.49

EER at 35°C/150kW	kW/kW	3.35
EER at 30°C/112.5kW	kW/kW	4.42
EER at 25°C/75kW	kW/kW	5.76
EER at 20°C/37.5kW	kW/kW	6.81



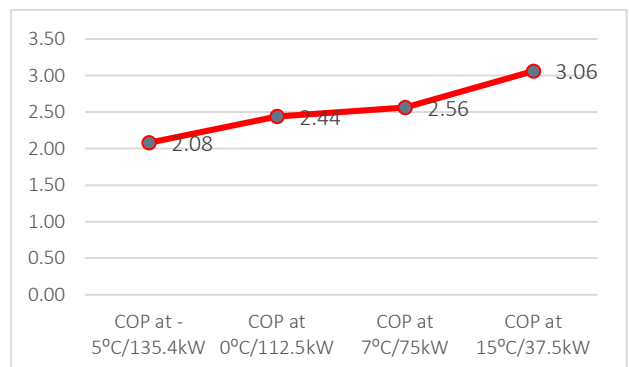
*SEER given as an indication based on the guidance found in Part L of the building regulations with a fixed flow rate of 7.2l/s.

$$SEER = (0.03 * EER@35^{\circ}C) + (0.33 * EER@30^{\circ}C) + (0.41 * EER@25^{\circ}C) + (0.23 * EER@20^{\circ}C)$$

Seasonal Efficiencies - SCOP User Defined

Prated,h	kW	135.4
Fluid Outlet Temp	°C	55
SCOP**	kW/kW	2.54

COP at -5°C/135.4kW	kW/kW	2.08
COP at 0°C/112.5kW	kW/kW	2.44
COP at 7°C/75kW	kW/kW	2.56
COP at 15°C/37.5kW	kW/kW	3.06



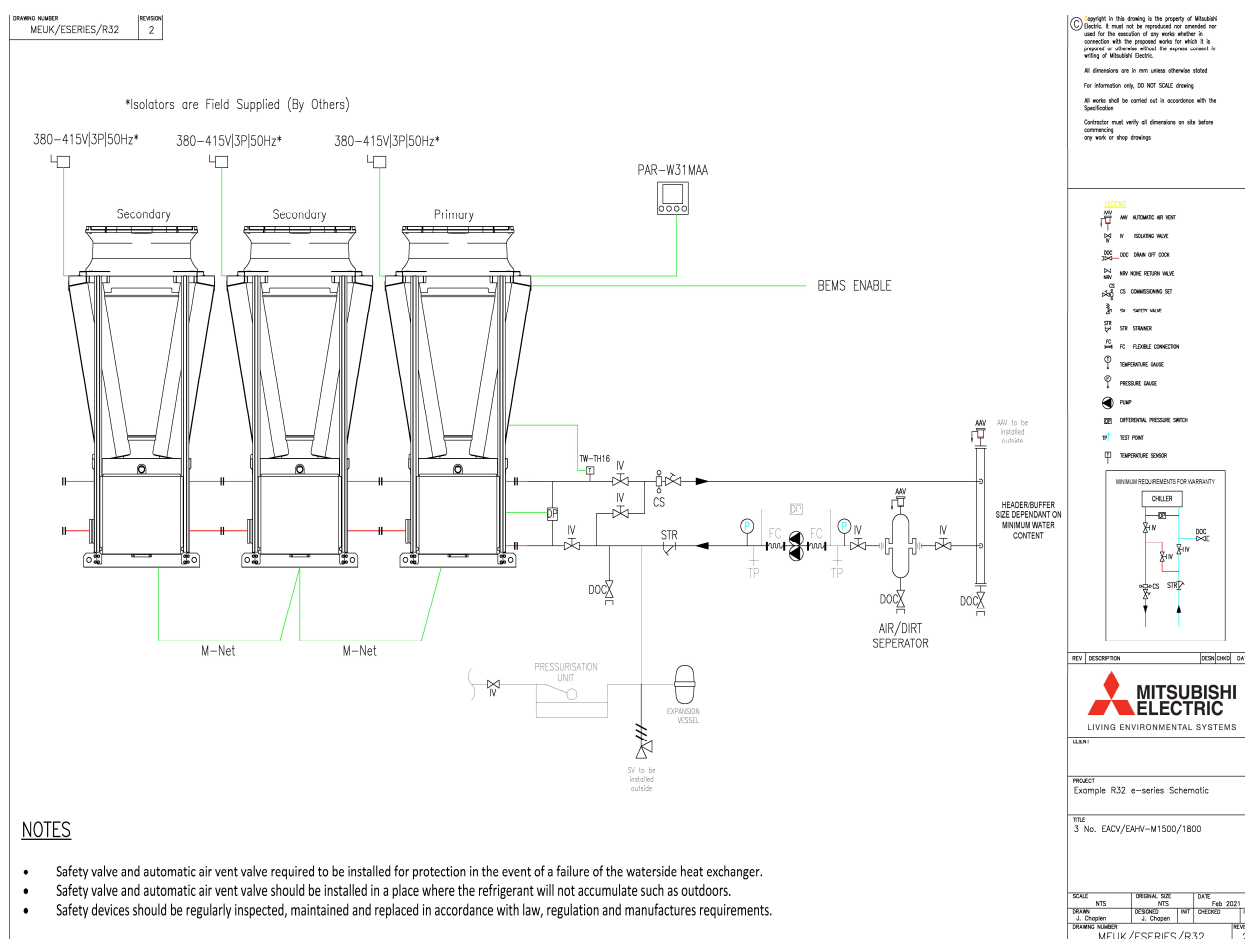
**SCOP given as an indication based on simplified ambient temperatures and weighting from EN18525 with a fixed flow rate of 7.2l/s.

$$SCOP = (0.05 * COP@-5^{\circ}C) + (0.4 * COP@0^{\circ}C) + (0.45 * COP@7^{\circ}C) + (0.1 * COP@15^{\circ}C)$$

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Example Schematic



Water Filtration

Strainer	Magnetic Filter	Air Dirt Separator
20 Mesh or More (Minimum)	Recommended if steel pipe	Minimum

Minimum-Without this filtration method the installations risks not receiving full warranty.

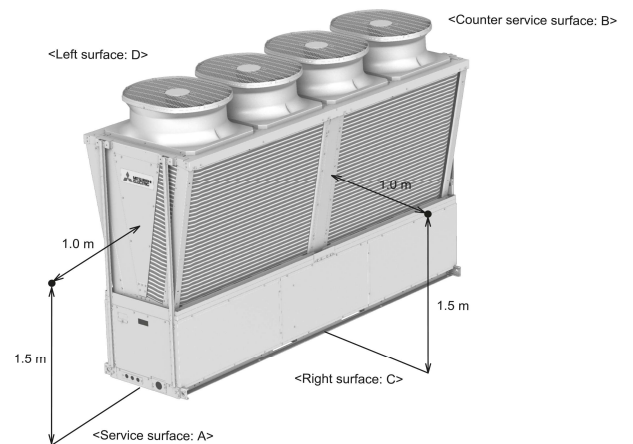
Recommended -This filtration method has recognised benefits for this type of system but its inclusion will not affect warranty

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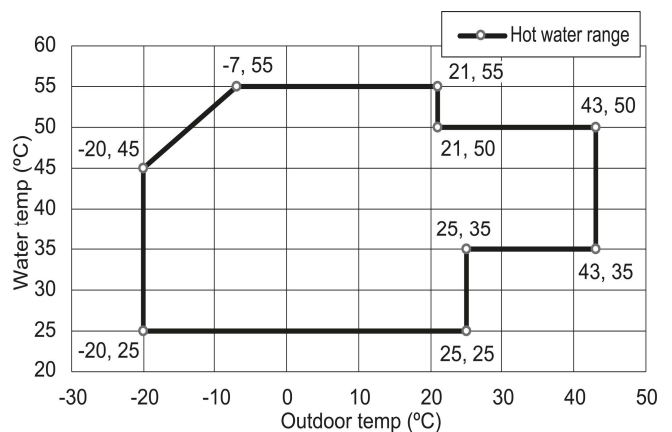
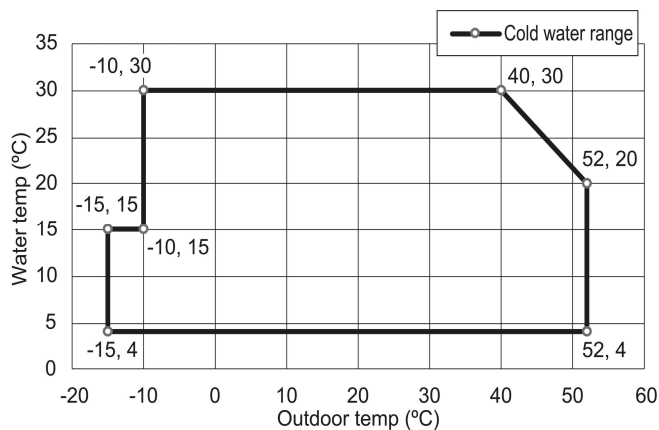
Air Source Reversible Heat Pump / Chiller

Noise Level

EAHV-M1500YCL(-N)	
Measured Location	Sound Pressure Level dB(A)
Service Surface A	65
Counter Service Surface B	65
Right Surface C	68
Left Surface D	69



Operating Window

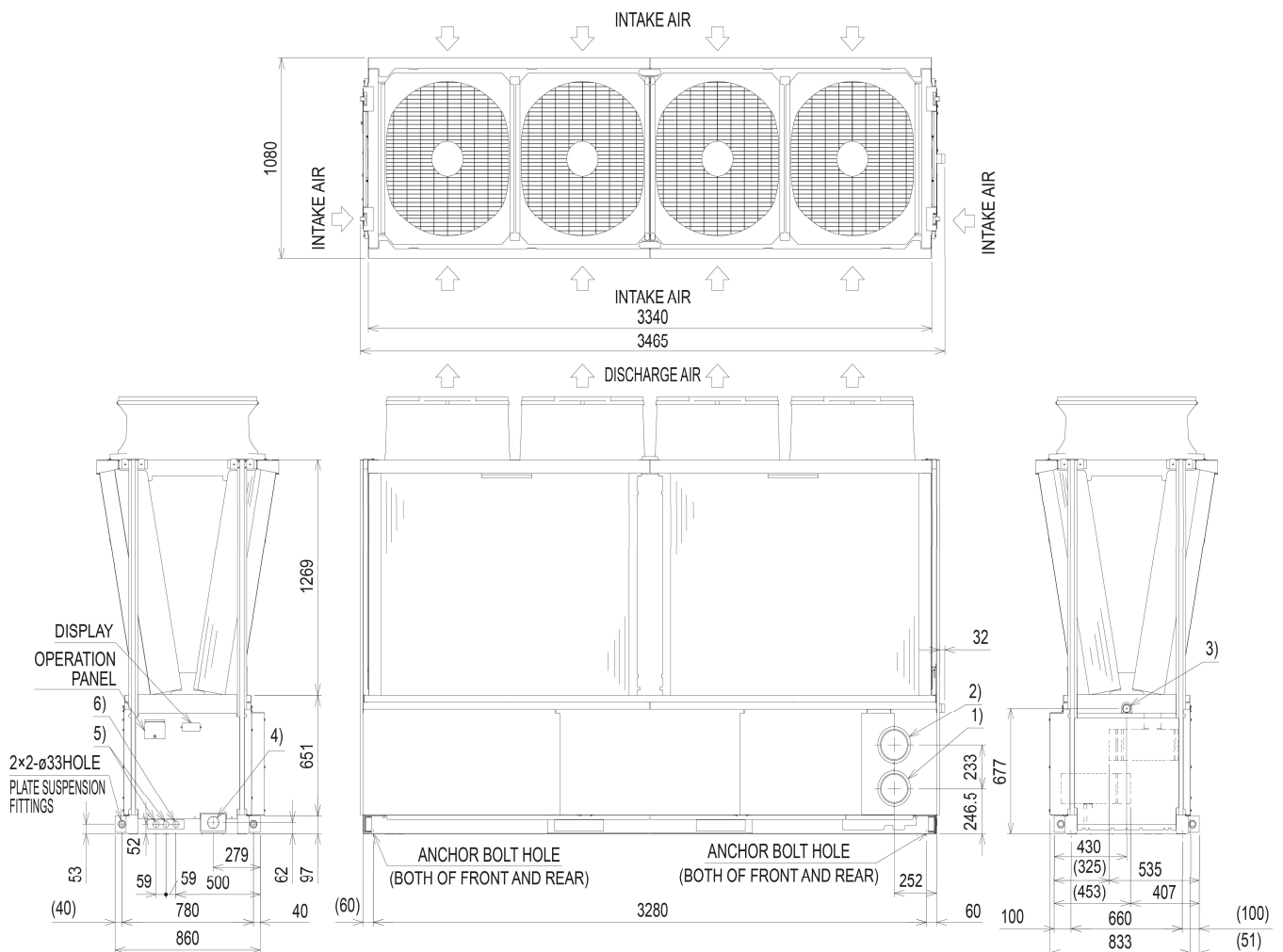


EAHV Models Only

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Air Source Reversible Heat Pump / Chiller

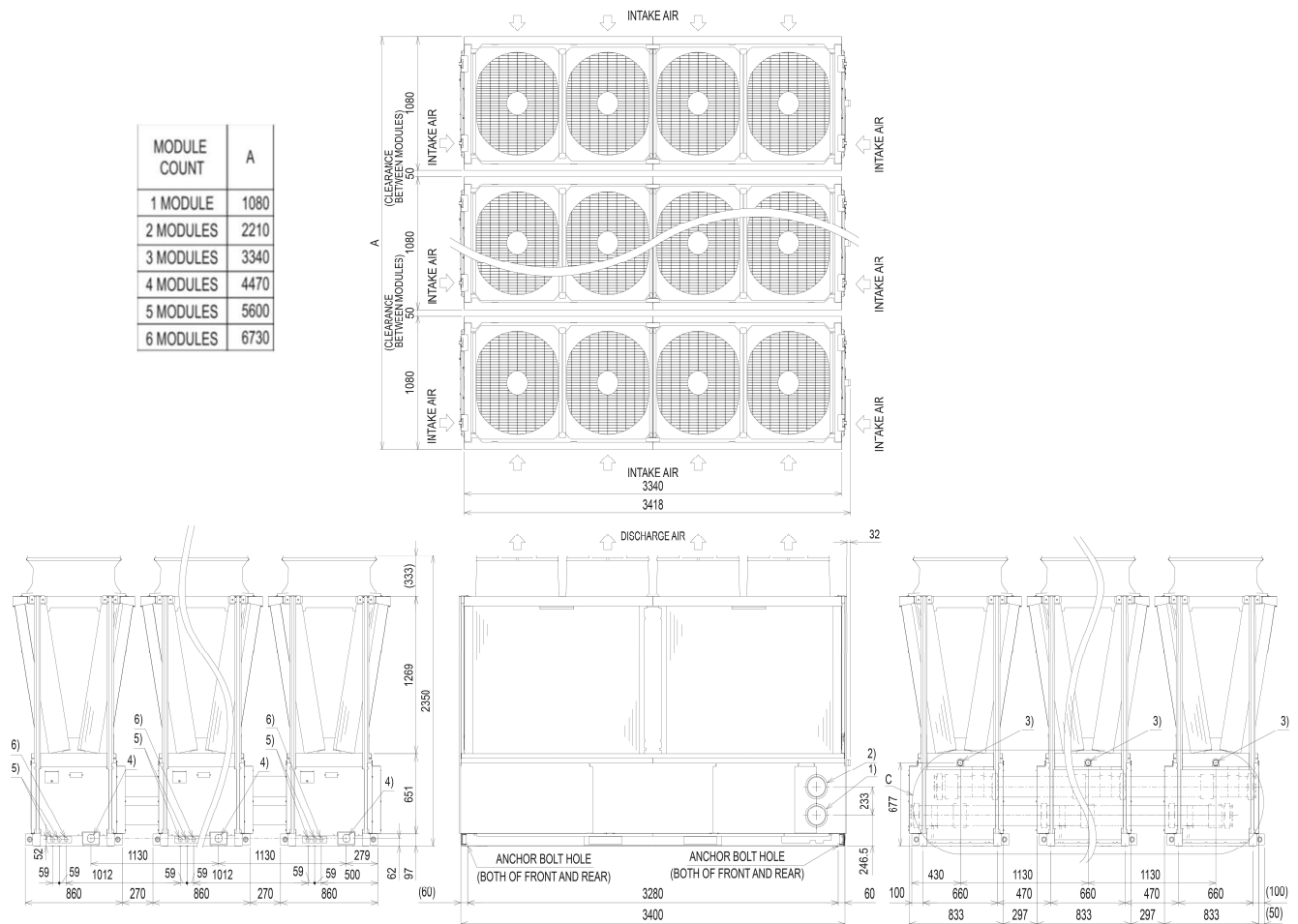
Dimensions



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Air Source Reversible Heat Pump / Chiller

Dimensions





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Import to Read

IMPORTANT: Please read and observe our “Safety precaution” warnings and cautions and any warnings included within the Technical guidance set out in the relevant equipment data book before you carry out any function on the product. This output is based upon the best available information but is given as indicative guidance only and should not be considered as final system design. We recommend that the information in this Technical Proposal Form is read in conjunction with the latest equipment data book and installation manual at all times. All water systems should be designed, installed and commissioned in accordance with industry good practice guidelines; such as, but not limited to: BSRIA Guide BG2/2010 – Water System Commissioning, BSRIA Guide BG29/2012 – Pre-Commissioning of Pipework Systems, BSRIA Guide BG50/2013 – Water Treatment for Closed Heating & Cooling Systems, CIBSE Commissioning Code W – Water distribution systems.

Mitsubishi Electric takes no design responsibility or liability for the system, components, equipment selections or control strategy – it is your responsibility to check the suitability of the proposed equipment selections. In order to comply with the Mitsubishi Electric warranty requirements all Mitsubishi Electric products must have adequate planned preventative maintenance undertaken in accordance with our recommendations. To meet Mitsubishi Electric’s warranty requirements a suitable method of filtration must be provided within the system – please refer to installation manual available from the document library. The recommended water flow rates must be maintained at all times when the equipment is operating. Particular attention should be paid to any change in pressure drop due to glycol and start up temperatures. Operating the equipment with less than the minimum flow rate will invalidate the warranty.

The freezing temperatures, capacity de-rates and pressure drop based on glycol concentration will vary between manufacturers. We also remind you of our quotation texts:

This quotation is given by Mitsubishi Electric in good faith based upon information provided by you or your company. We have not undertaken a site survey to support this quotation. Whilst we endeavour to factor into our quotation any special site conditions or user requirements which you may have expressly identified to us previously in writing, this quotation is not a project system design and is not a confirmation of project volumetric or yield analysis. We recommend that you assess final product selection and make the final system design based upon your own volumetric or yield analysis and project knowledge, including any project requirements which might impact on that selection. Please check carefully any requirement for a Mitsubishi Electric product to integrate with any third party equipment. We are not responsible for integration capability of our products with any third party equipment unless we have expressly confirmed that this integration is approved in the current Mitsubishi Electric product specification or in a current technical bulletin.