TECHNICAL BULLETIN

PRODUCT: GREENSTAR REGULAR GAS BOILERS

CASCADING OF BOILERS WITH CYLINDERS AND ZONED CENTRAL HEATING:

For larger properties one boiler may not have a large enough output or multiple boilers maybe required. For these cases we can recommend a cascade (or modular) system, however we would recommend that this is only for an arrangement of no more than two boilers.

For larger output requirements please contact the Commercial Technical Support team on 0844 892 3004

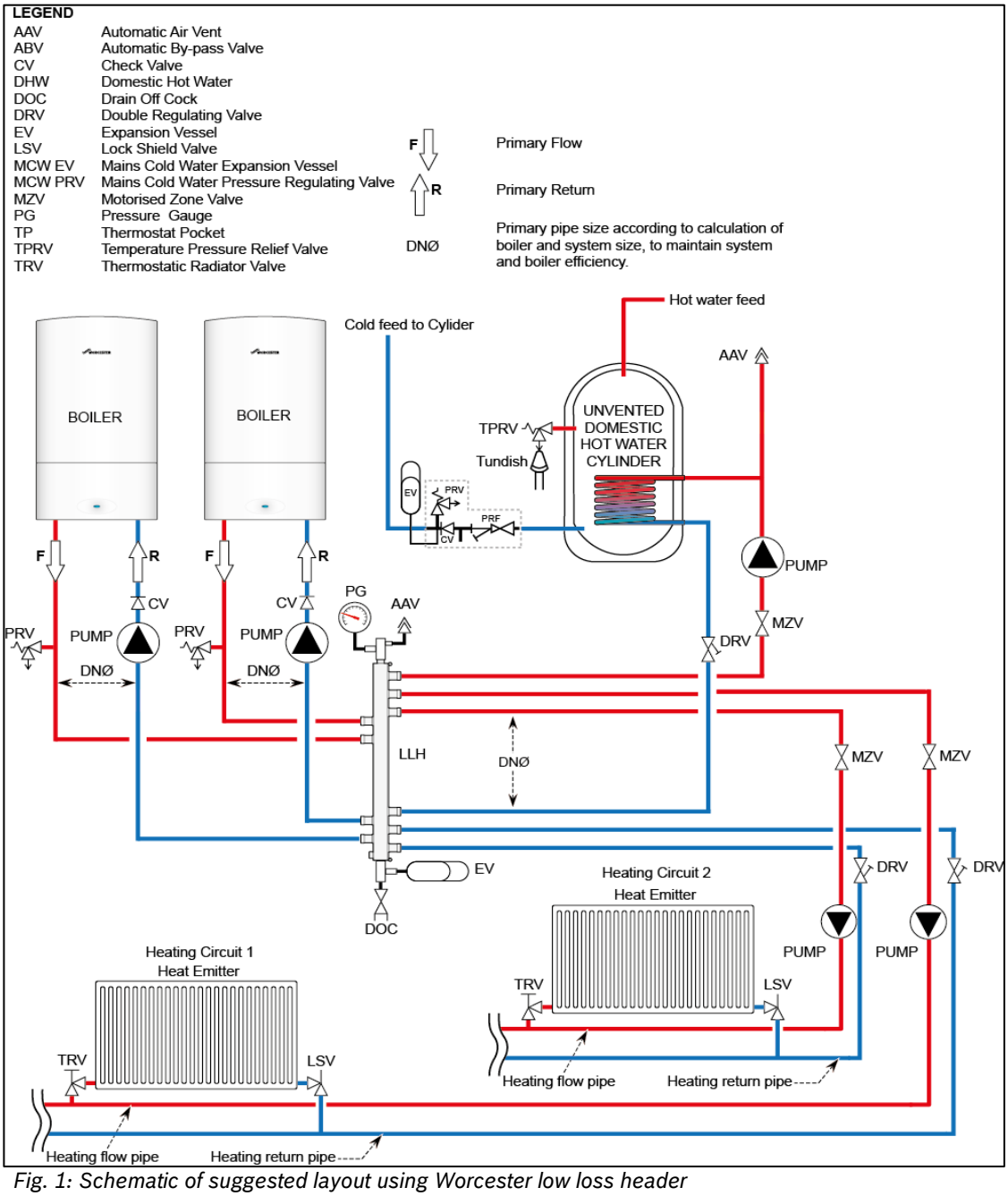

Fig. 1: Schematic of suggested layout using Worcester low loss header

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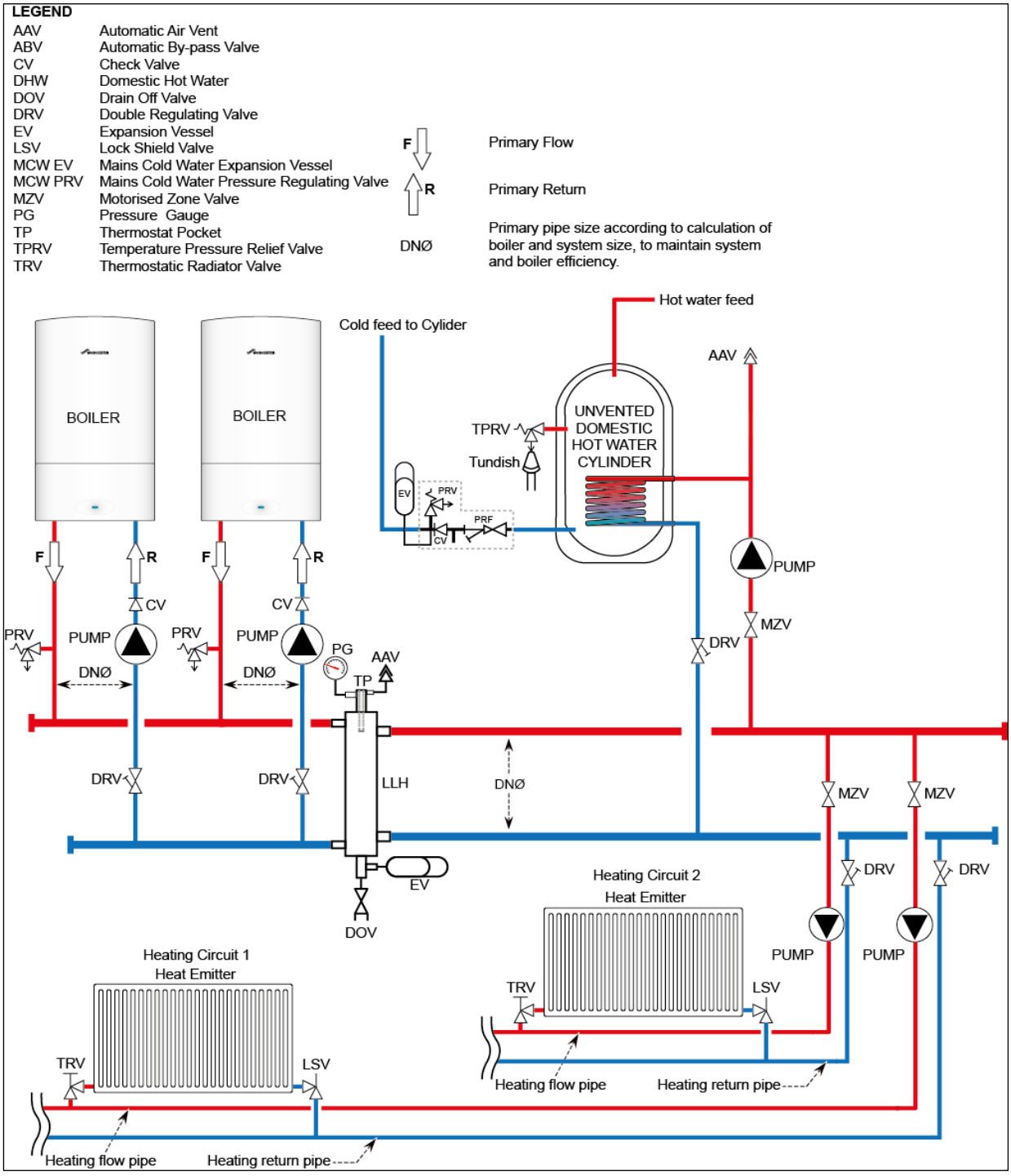

Fig. 2: Suggested layout using a third party low loss header

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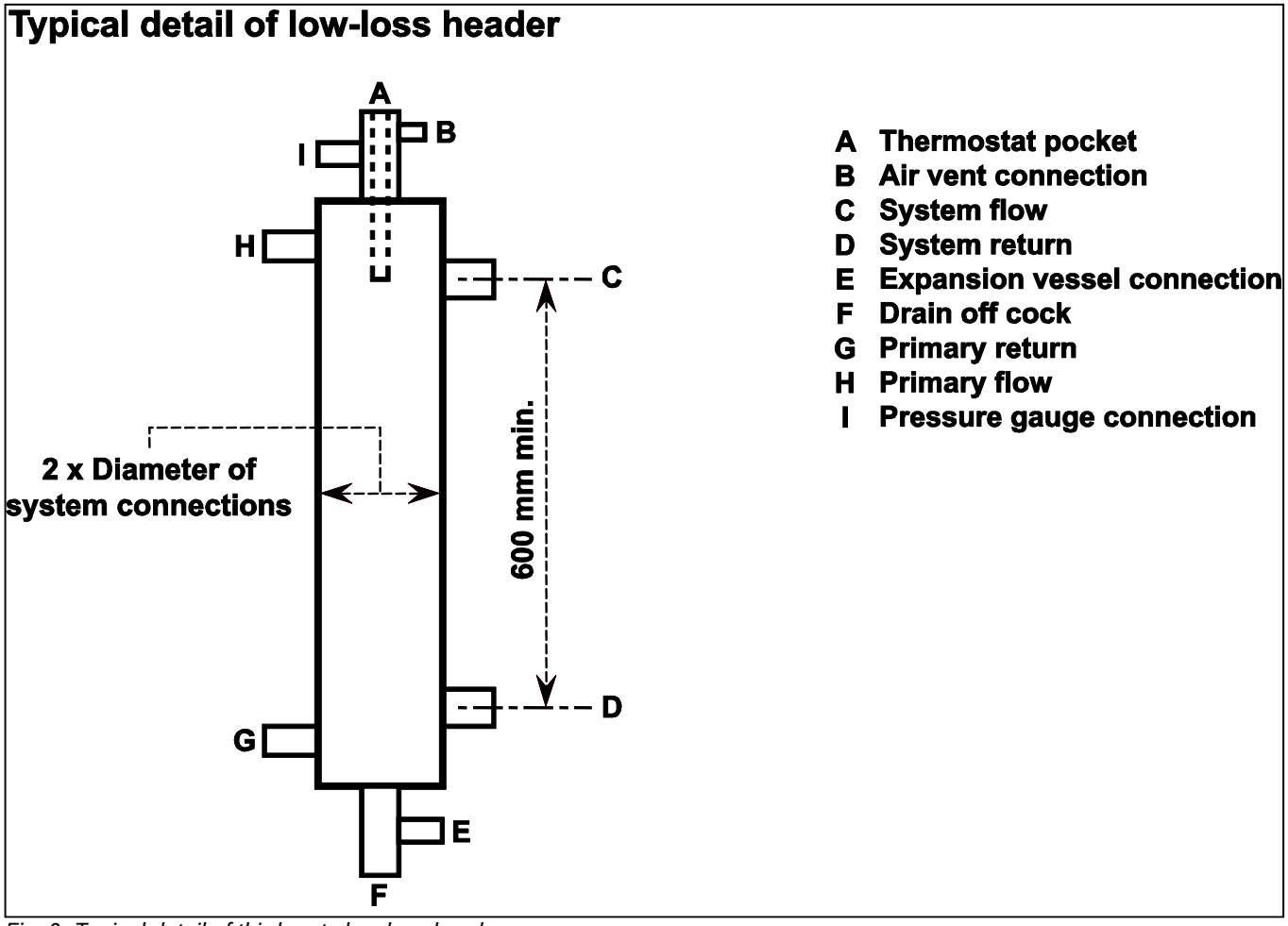

Fig. 2: Typical detail of third party low-loss header

1. The pumps will need to be sized according to the output required by the system.
2. The Low Loss Header will need to be sized to match the output of the boilers.
3. The expansion vessel will need to be sized and pressurized to match the system.
4. The Motorised Zone Valve(s) will need to be sized to match the circuit output.
5. No isolation valves should be used on the boiler side of the low loss header.

IMPORTANT NOTE:

The installation must be undertaken by a competent, qualifed engineer, in accordance with all current standards and regulations.

Wiring and controls must be designed to match the system requirements and must be fitted in accordance with all current standards and regulations.

This is only an example of how a typical system can be installed. We recommend you seek the assistance of a system design engineer.
A lot of factors need to be calculated to get the best efficiency out of the system, if this is not done the system may not work efficiently, reducing the lifetime of components and making the system less efficient.

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FAQ's FOR JOINING TWO WORCESTER BOILERS

What is the maximum output of the boilers that I can join together?

When working under domestic ACS qualifications in domestic dwellings, a maximum total of 70kW input Net, should be adhered to. The Worcester Low Loss header (part number 7716 192 614) has a maximum combined output of 70kW.

What is a DRV?

A double regulating valve is a device used to set the design flow rate for a particular circuit. Hydraulic problems can occur when flow rates either side of the low loss header become unbalanced. Fitting regulating valves to each circuit ensures you have the means in place to rectify any issues. By setting the design flow rate to make sure you have the correct Delta T (ΔT), this will also help the boiler to achieve best efficiency.

What diameter should my pipe work be between the boiler and LLH?

This must be sized to suit the flow rate from the total boiler output. The Domestic Heating Design Guide can be used to calculate flow rate and provide pipe size guidelines. Remember that the flow velocity should not exceed 1 m/s or noise issues could become apparent but should be above 0.3 m/s.

What pump speeds should I set?

Hydraulic balance either side of the Low Loss header is the aim. Use the lowest pump speed that delivers heat to all heating emitters on the circuit. Use a differential thermometer to check you have the correct delta T across all radiators (typical ΔT 10K on older systems or standard efficiency boilers and ΔT 20K for modern condensing boiler systems where the radiators are capable of delivering the design temperature at ΔT 20K). Check the delta T across the main flow and return to all circuits, adjusting with the DRV if necessary. For details of the pressure losses across Worcester regular boilers, please consult Worcester Technical Bulletin TB 0048.

What is the thermostat pocket on the LLH for?

For proper control of a cascade, a sequence controller is desirable to ensure the boiler output is matched to the system demand. If a third party controller is used the header sensor can be placed in the low loss header pocket.
If there is no sequence controller a lead and lag arrangement can be used, where one boiler thermostat is set 5 degrees higher than the other. The lead boiler should be changed at each annual service to even out the use. If there is no pocket available then the sensor can be securely strapped to the low loss header

Can I install a system like this in a commercial property on domestic ACS?

No, installations in a commercial property would use different standards and will typically incorporate a gas meter larger than 16m³/h. Installers should hold commercial ACS qualifications to install a system in a commercial property. Contact Gas Safe for more information and guidance.

Will my gas supply be large enough?

When assessing this, all of the appliances installed in the property must be taken into account. The change to IGE/UP/1b has allowed installers holding domestic qualifications to work on a system up to a meter size of 16m³/h and 35mm pipe work as long as the system volume does not exceed 0.035m³.

Can I use a filling loop to fill the system?

Water regulations state that a system over 45kW comes into fluid category 3. This means that as long as the dwelling is a "house" it can still be filled via a filling loop. A "Non House" must incorporate an RPZ valve (reduced pressure zone device) to ensure no contamination of the water supply can take place.

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