

Gas Industry Standard

GIS/TR29: 2022

Specification for

PIPELINE MARKER POSTS



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Foreword

Gas Industry Standards (GIS) are revised, when necessary, by the issue of new editions. Users should ensure that they are in possession of the latest edition. Contractors and other users external to Gas Transporters should direct their requests for copies of a GIS to the department or group responsible for the initial issue of their contract documentation.

Comments and queries regarding the technical content of this document should be directed in the first instance to the contract department of the Gas Transporter responsible for the initial issue of their contract documentation.

This standard calls for the use of procedures that may be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

Compliance with this engineering document does not confer immunity from prosecution for breach of statutory or other legal obligations.

Mandatory and non-mandatory requirements

For the purposes of a GIS the following auxiliary verbs have the meanings indicated:

can indicates a physical possibility;

may indicates an option that is not mandatory;

shall indicates a GIS requirement;

should indicates best practice and is the preferred option. If an alternative method is used then a suitable and sufficient risk assessment needs to be completed to show that the alternative method delivers the same, or better, level of protection.

Disclaimer

This engineering document is provided for use by Gas Transporters and such of their contractors as are obliged by the terms of their contracts to comply with this engineering document. Where this engineering document is used by any other party, it is the responsibility of that party to ensure that the engineering document is correctly applied.

Brief history

First published as T/SP/TR/29 by National Grid	January 2007
Second update published	April 2010
Third update published	November 2014
Re-drafted as a Gas Industry Standard and adopted by all networks	December 2022

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1. Scope

This Gas Industry Standard specifies the design of marker posts for pipelines operating above 2 barg. Where appropriate these designs may also be used on pipelines operating below 2 barg.

The primary benefit of marking pipeline routes is to make third parties aware of the presence of a pipeline and to provide pipeline owner contact details when the third party is working in the vicinity of the pipeline or in case of emergency. Marker posts are designed to provide mitigation against potential third party damage, therefore reducing the risk to both people and security of supply. This specification should be used in conjunction with gas network procedures covering the siting and installation of marker posts, including rural and urban areas, National Parks, Areas of Outstanding Natural Beauty and other sensitive areas.

This specification will generally be used for the installation of new marker posts and remedial actions following line walking or reports of missing marker posts.

2. Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

2.1 British Standards

BS 8500-1, *Concrete. Complementary British Standard to BS EN 206. Method of specifying and guidance for the specifier*

BS 8500-2, *Concrete. Complementary British Standard to BS EN 206. Specification for constituent materials and concrete*

BS 13369, *Common rules for precast concrete product*

BS 15258, *Precast concrete products. Retaining wall elements*

NOTE Where no date is shown, the latest edition of each standard and specification shall apply.

3. Terms and Definitions

For the purposes of this document, the following definitions apply.

- 3.1 CP - Cathodic Protection.
- 3.2 HDPE - High Density Polyethylene used in manufacture of posts
- 3.3 LCP - Lightning Control Pillar
- 3.4 LDPE - Low Density Polyethylene used for screws to secure face plate
- 3.5 M4 - Field boundary marker post design
- 3.6 M28 - Cathodic protection test post design integrally moulded to contain CP logging equipment and wires
- 3.7 MDPE - Medium Density Polyethylene used in manufacture of the CP posts
- 3.8 SRP - Surveillance Reporting for Pipelines

4. Marker Post Designs

Marker posts should not require any routine maintenance.

4.1 Aerial Marker Posts

Note: These Aerial Marker Post requirements do not apply to Gas Networks Ireland who use a separate design and should be contacted directly for details.

Aerial Marker Posts should be constructed from 118mm diameter white high density polyethylene tube, using recycled material wherever possible. The marker post should be a minimum of 2.5m in length, with 2m visible above the ground.

If required, shorter lengths may be ordered for ease of handling and transportation, and then joined with a connecting socket. Similarly, smaller diameter posts of not less than 76mm (3") diameter may be installed with the prior agreement of the asset owner.

The Aerial Marker Post shall be in accordance with Figure 1.

The aerial marker post notice shall be in accordance with section 5.1 and shall be placed near the top and bottom of the post at the most visible orientation.

For locations where aerial marker posts may be subject to vandalism or damage, they be installed with a wooden post inside them to increase their strength.

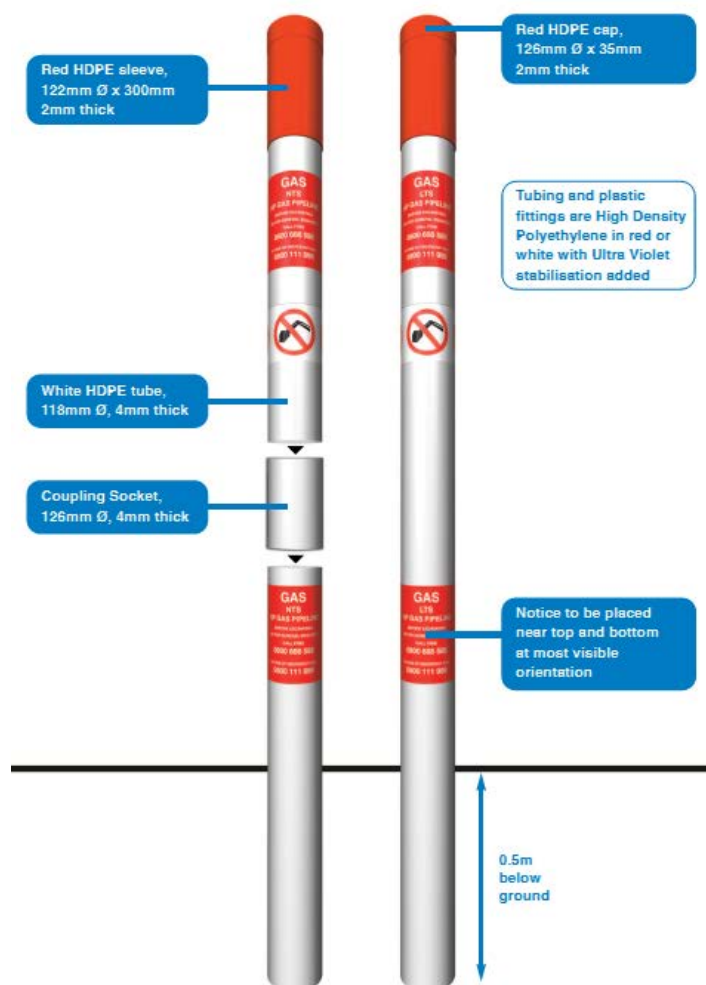


Figure 1: Typical detail of Aerial Marker Post appearance

4.2 M4 Field Boundary Marker Posts

The lightweight M4 Field Boundary Post should be manufactured from high density polyethylene, using recycled material wherever possible, and coloured white with ultra-violet stabilisation added.

The post should be 1m high, with about 500 mm installed below ground.

The lightweight M4 Field Boundary Post shall be in accordance with Figure 2.

The M4 face plate shall be in accordance with section 5.2 and shall be fixed to the front of the Marker Posts using Low Density Polyethylene (LDPE) black UV stable screws.

M4 HDPE Field Boundary Marker Post may be ordered with face plate and fixings as a package. An adhesive or printed notice may be placed further down the post stating 'Gas Pipeline'. This post specification shall weigh approximately 2.4 kg.

Where required, the post may be secured in situ by installing a horizontal bar through the hole in the base prior to backfilling and / or securing it in place with cement.

For locations where marker posts may be subject to vandalism or damage, equivalent concrete M4 field boundary marker posts should be considered.



Figure 2: A HDPE M4 marker post design (face plates may differ from example shown)

4.3 M28 Cathodic Protection Test Posts

The M28 Cathodic Protection (CP) Test Posts incorporate the CP test leads. M28 CP test post shall be constructed of a Medium Density Polyethylene (MDPE), shaped and sized as shown in Figure 3. The marker post shall be made from self-coloured UV stabilised plastic, which prevents loss of colour and eliminates the cost of painting and maintenance. The MDPE CP test posts are light, weighing approximately 2.4 kg before CP logging is introduced. The MDPE moulded post shall have a ribbed construction providing strength so it can be used in urban areas. The posts shall be handled and transported with ease via interlocking system of both M28 and M4 posts. The M28 face plate (see section 5.3) shall be fixed to the front of the post using hexagonal head face plate fixing to provide additional security, these should be removable to allow easy access to CP logging equipment for maintenance.

The CP test post shall consist of an integral moulded recess which shall enable easy installation of remote logging equipment (see Figure 4) and a moulded tube at the rear to enable the buried CP cables to be threaded through (see Figure 3). The CP test post shall have provision for four holes, at the side, for CP tags to be attached to the terminal for on-site monitoring. These should be blind holes and not to be pre drilled.

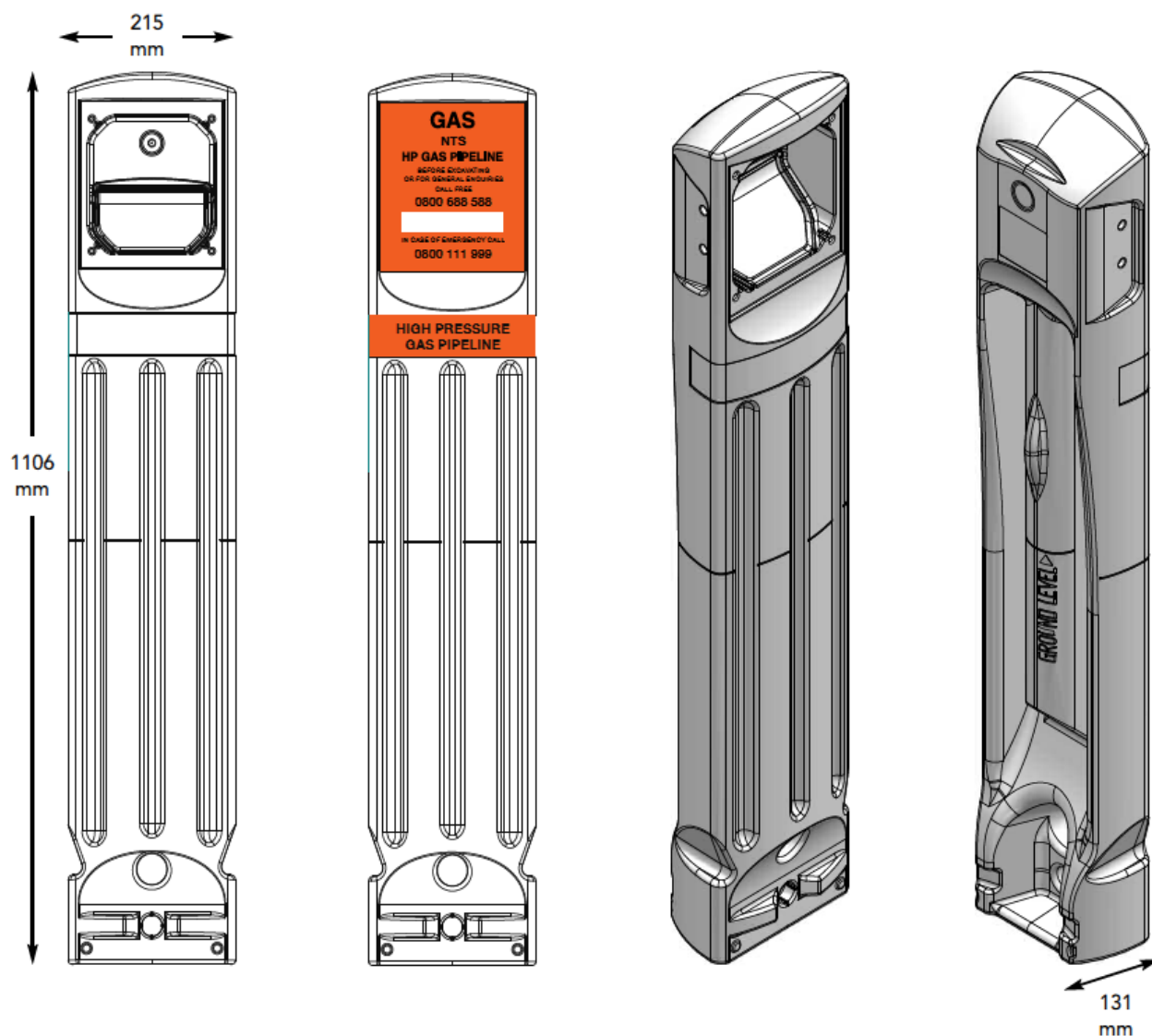


Figure 3: The HDPE M28 Cathodic Protection test post (face plates may differ from example shown)

An adhesive notice may be placed further down the post, such as 'High Pressure Gas Pipeline'.

The CP test post shall be marked with moulded-in ground level half way up the post to ensure consistent installation height and an installation depth of 500mm.

Where required, the post may be secured in situ by installing a horizontal bar through the hole in the base prior to backfilling and / or securing it in place with cement.

For locations where marker posts may be subject to vandalism or damage or subject to other assessment, equivalent concrete M28 CP marker posts should be considered.



Figure 4: Large moulded recess for remote logging equipment

4.4 Shallow Depth of Cover Marker

Low and Medium pressure markers shall be constructed from 118mm diameter, 4mm thick white HDPE tube made from recycled material, if possible.

They shall be a minimum of 2.5m in length, with 2m visible above the ground. If required, shorter lengths can be ordered for ease of handling and transportation, and then joined with a connecting socket.

Coupling sockets should be 126mm diameter, 4mm thick

They should have the ability to place additional notices/labels at low level in the event that the post is damaged by hedge trimming.

The cap and sleeve shall be a distinguishable colour from the marker post and visible from the surroundings in which it is located. The coloured cap should be 2mm thick and 126mm in diameter x 35mm. The coloured sleeve should be 2mm thick and 122mm in diameter x 300mm.

Notices placed on the marker post shall inform 3rd parties as to the nature of the hazard, who to contact prior to commencing works and who to contact in case of emergency, be UV resilient. Be height of 204 mm and width 179 mm and have a high visibility background and lettering.

The pressure tier & gas pipeline phrase should be prominent to make the hazard obvious. Contain the following information:

XXXX Pressure Gas Pipeline *

Before excavating call free XXXX XXX XXX *

In case of emergency call XXXX XXX XXX *

* Gas Transporter to specify pressure tier and contact details

This labelling shall be placed below the cap of the post, at eye level so that it draws the observer's eye and be on sub surface printed labels.

These labels use the reverse of clear PVC with a high bond double-sided adhesive applied and offer reduced impact of UV rays and the effect of atmospheric conditions. Figure 5 shows an example of LP and MP markers the label can be substituted for higher pressure tiers.



Figure 5: Example showing LP / MP Marker

4.5 Lightning Control Pillars

Lightning Control Pillars (LCP) are generally installed on pipelines affected by A.C. interaction, flash-over from overhead lines or affected by regular lightning strikes. The LCP design is to reduce any electrical contact from the pipeline to the general public and operatives.

The LCP shall be able to incorporate CP test leads. The back board within the LCP should be a 9mm thick ply or tufnol panel. There shall be sufficient space on the panel for internal components including loggers, cables, terminals, and other necessary equipment. No holes are to be drilled into the LCP for CP tags for on-site monitoring. The LCP shall be constructed with glass fibre reinforced concrete with an aluminium front plate. The LCP must have a key operated latch installed.

The glass fibre reinforced concrete must have:

- a mechanical resistance performance of 50 N/mm² compressive strength (BS15258);
- mix parameters of 450kg/m³, free water cement ratio: <0.55, consistence: SF2; fibre reinforcement: 6kg/ m³ Durus S500 plastic fibres, Admixture: Chryso Premia 540 Super-plasticiser (BS8500 Pt 1 & 2);
- Durability adequate for normal serviceability conditions (BS13369).

The LCP shall have a clear yellow electrical warning sign stating that 'All terminals inside of the enclosure are to be treated as live'. Test post information shown in Figures 13, 14 or 15 shall also be on the front of the face plate.

The LCP shall be installed by excavating to a depth of 290mm, using hand tools only and observing safe digging practices. The LCP should also be designed so that concrete that is used to secure will get good adhesion around the LCP base.

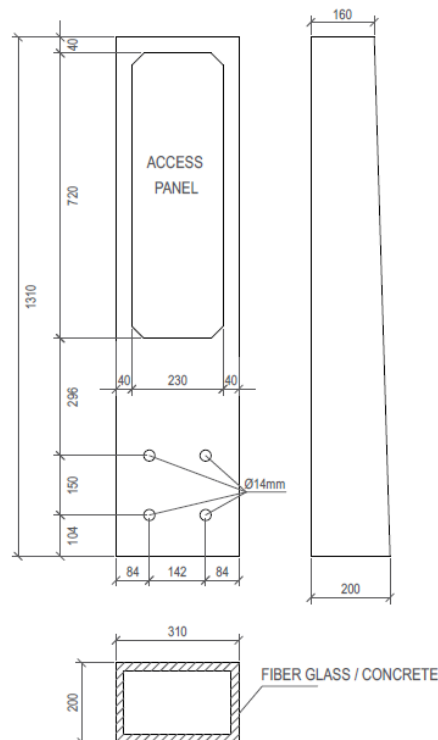


Figure 6: Lightning Control Pillar

5. Notices to be Placed on Marker Posts

Notices are placed on all marker posts to inform 3rd parties as to the nature of the hazard, who to contact prior to commencing works, and who to contact in case of emergency. Where specified by the asset owner this information may also need to be displayed in 2 languages.

It is assumed that the marker post notices will remain valid for the lifetime of the pipeline. It is not necessary to include the company name since this information can become redundant, however this is at the discretion of the company. Any non-geographical telephone numbers, such as the 0800 111 999 number, are easily transferable.

Where specified by the Gas Transporter, additional provision for the identification of an asset (valves, road, rail, above ground and river crossings etc.) may be required. Similarly, the Gas Transporter may specify additional requirements, such as the dimensions for the fixing holes or the thickness of the notice.

All notices shall be UV resilient.

5.1 Notices for Aerial Marker Posts

Aerial marker posts should have a self-adhesive notice placed on them.

The notice shall contain the following information:

- XXXX Pressure Gas Pipeline
- Before excavating call free on XXXX XXX XXX *
- In case of emergency call XXXX XXX XXX *

* Gas Transporter to specify pressure tier and contact details

The notice should have a high visibility RED background with WHITE lettering. The HP gas pipeline phrase should be prominent to make the hazard obvious.

The notices are shown below in Figure 7 (for Gas Transmission) and Figure 8 and 9 (for Gas Distribution).

The notice shall be placed below the cap of the post, at eye level so that it draws the observer's eye. If the marker post is installed on a hedge boundary, consideration should be given to placing a further notice toward the base in the event that the post is damaged by hedge trimming.

For the optimum life expectancy (i.e. reduced impact of UV rays and the effect of atmospheric conditions), sub surface printed labels should be used. These labels use the reverse of clear PVC with a high bond double-sided adhesive applied. The background colour should be a deeper red to offer a longer life than the lighter orange.

Size of notices should be height of 204 mm and width 179 mm.



Figure 7: Example format for aerial marker post adhesive notices for Gas Transmission (NTS)



Figure 8: Example format for aerial marker post adhesive notices for Gas Distribution HP pipelines



Figure 9: Example format for aerial marker post adhesive notices for Gas Distribution IP pipelines

5.2 Notices for M4 field boundary posts

The face plate shall have information, and be formatted, as shown in Figure 10 (for Gas Transmission) and Figures 11 and 12 (for Gas Distribution). The Gas Transporter shall specify the pressure tier and contact details.

The face plate should be constructed from approximately 1mm thick polycarbonate with suitable text sizes shown.

The face plate shall be bright ORANGE (for Gas Transmission) or YELLOW (for Gas Distribution) colour to provide good visibility in poor conditions with BLACK lettering. It shall be easy to maintain.

Size of notices should be height of 204 mm and width 179 mm.



Figure 10: Example Face Plate for M4 HDPE Field Boundary Marker Post for Gas Transmission (NTS)



Figure 11: Example Face Plate for M4 HDPE Field Boundary Marker Post for Gas Distribution HP pipelines

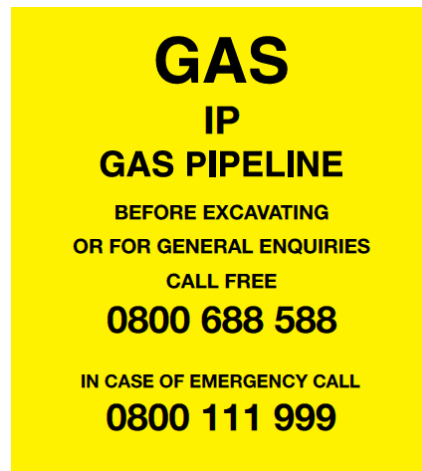


Figure 12: Example Face Plate for M4 HDPE Field Boundary Marker Post for Gas Distribution IP pipelines

5.3 Notices for M28 Cathodic Protection Test Posts and Lightning Control Pillars

The face plates shall have information, and be formatted, as shown in Figure 13 (for Gas Transmission) and Figures 14 and 15 (for Gas Distribution). The Gas Transporter shall specify the pressure tier and contact details.

The face plate should be constructed from approximately 2mm polycarbonate. The face plate shall be bright ORANGE (for Gas Transmission) or YELLOW (for Gas Distribution) in colour to provide good visibility in poor conditions with BLACK lettering. It shall be easy to maintain. The MDPE CP test post face plates shall have a clear window for individual reference numbers to be applied from the rear for extra security. The test post number window should be blanked off behind the number with a sticker of the same colour as face plate.

The size of notices should be height of 204 mm and width 179 mm.

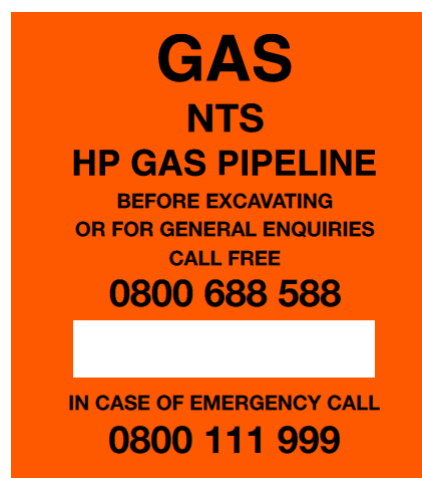


Figure 13: Example Face plate for the M28 CP test post for Gas Transmission (NTS)

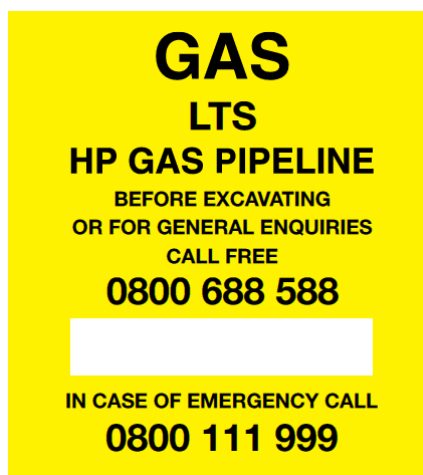


Figure 14: Example Face plate for the M28 CP test post, Gas Distribution HP pipelines

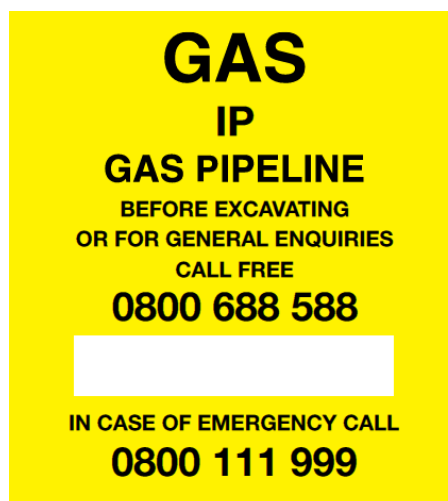


Figure 15: Example Face plate for the M28 CP test post, Gas Distribution IP pipelines

6. Prohibition Labels to be placed on Marker Posts

An adhesive sign representing no mechanical digging shall be placed on each of the marker posts.

6.1 Prohibition Label for the Aerial Marker Posts

The Aerial Marker Prohibition Label is shown below in Figure 16. It shall be 384mm x 120mm, printed on self adhesive white vinyl. The label shows three equidistance circular symbols of diameter 100mm. The symbol shall be a 10mm thick red circle with white interior, containing a black digger arm. The digger arm shall be crossed out with an 11mm thick red line at a 45 degree angle from north-west to south-east. The label shall be placed horizontally round the post, beneath the adhesive notice, with the upper edge parallel to and approximately 400mm below the red top hat. The central symbol should be placed at the front of the post and wrapped around the aerial post, joining with a slight overlap at the back; the right symbol underneath the left side to ensure no obstruction of the symbols.

Note: When the label cannot be positioned as above because of other notices, the label should be positioned below the existing upper notice, as close as available to eye level, without obstructing any information.



Figure 16: The Aerial Marker Post prohibition label

6.2 Prohibition Label for M4, M28 and LCP posts

The M4 Marker Post, M28 Test Post and Lightning Control Pillar prohibition label shall be as shown in Figure 17. It shall be a 4mm thick red circle with white interior showing a black digger arm as above. It shall be 40mm diameter, and across this digger arm will be a 5mm thick red line at 45 degrees from north-west to south-east. The label shall be printed on laminated 0.25mm clear PVC with high strength adhesive for bonding onto HDPE marker posts.

The M4 Test Post label should be placed on the centre line (in the moulded square shape or onto the HDPE post) directly below the face plate.

On the CP test post the prohibition label shall be placed on the HDPE post centre line, directly below the face plate.

In both cases, the label will be positioned so that the digger and the line through it are in the same orientation as Figure 16 shows.



Figure 17: The M4, M28 & LCP Marker Post prohibition label