Strategic Management Board

ACS.CMA3
SAFETY ASSESSMENT CRITERIA
INITIAL AND RE-ASSESSMENT
GAS METER INSTALLER
DOMESTIC
NATURAL GAS WITH A MAXIMUM CAPACITY NOT EXCEEDING 6m^3/h

Introduction

Tests gas safety competence in core domestic gas metering work **(CMA3).**

This domestic metering core is only suitable for MET1 and with the option of REGT1.

Range

All gas fittings in-conjunction with the installation of primary domestic gas meters of capacity ≤ 6 m^3/h, connecting to an outlet supply ≤ 1 ¼ or 35mm and with a volume ≤ 0.035 m^3

The Installation pipework element is equivalent to the criteria used in CCN1.

Pre-requisites

Initial

Initial (suitable proof of gas work training and experience as appropriate)

Exclusions

Work on appliances other than re-lighting after a temporary interruption to gas supply.
Work in a non-domestic premises.
Work on the special requirements for the installation & commissioning of the communication and data systems on smart meters.

References and normative documents

MIs.

All relevant documents as listed in the Legislative, Normative & Informative Document List (LINDL), inc.:

- HSL56
- GIUSP
- BS 6400-1
- IGEM/UP/1B Edition 3

ACS.SMB.003.ACDND identifies normative documents that should be held by ACs.
Where a reference point (Ref) is listed in this criteria this is only a guide to where the criteria could be resourced, therefore the Ref may not be exhaustive.

Abbreviations

AC. Assessment Centre
AECV. Additional emergency control valve
AIV. Appliance Isolation Valve
CFS. Communal Flue Systems
CSST. Corrugated stainless steel tube
ECV. Emergency control valve
ESP. Emergency service provider
GT. Gas transporter
I. Initial

IV. Installation volume
LDF. Leak detection fluid
MIs. Manufacturer's/manufacturers' instructions
MIV. Meter inlet valve
MOP. Maximum operating pressure
OP. Operating pressure
OQ. Oral questioning
R. Re-assessment
Ref. Reference.

1. Gas Safety Legislation

KNOWLEDGE & UNDERSTANDING		REF	I	R
1.	**HSL56:**			
(i)	Reg.2 General interpretation and application 2(1), (2), (3), (4), (5)c (iii), (6), (7) (8)		√	
(ii)	Reg.3 Qualification and supervision 3(1), (2), (3), (5), (6), (7) and (8)		√	
(iii)	Reg.4 Duty on employer		√	
(iv)	Reg.5 Materials and workmanship 5(1) to (3)		√	
(v)	Reg.6 General safety precautions 6(1) to (6)		√	
(vi)	Reg.7 Protection against damage 7(1) to (3)		√	
(vii)	Reg.8 Existing gas fittings 8(1) to (3)		√	
(viii)	Reg.25 Interpretation of Part E.		√	
(ix)	Reg.26 Gas appliances - safety precautions 26(1) to (10)		√	
(x)	Reg. 36 Duties of Landlords 36 (1) to (12)		√	

2. Gas emergency actions and procedures

KNOWLEDGE & UNDERSTANDING		REF	I	R
1.	**priorities of actions and responsibilities:**			
(i)	action to stop a gas escape downstream of ECV		√	
(ii)	action if gas continues to escape after turning off supply		√	
2.	limits of flammability		√	
3.	specific gravity and its effect in relation to air		√	
4.	hazardous ignition sources and their elimination		√	
5.	methods of preventing/reducing dangerous concentrations of gas in atmosphere		√	
6.	advice to occupants		√	
7.	HSL56: Reg.37 Escape of gas 37(1) to (4)		√	

3. Products and characteristics of combustion

PERFORMANCE CRITERIA		REF	I	R
1.	**inspect flame pictures of a selection of burners visually to identify those:**			
(i)	indicating complete combustion		√	√
(ii)	indicating incomplete combustion		√	√
2.	**identify incomplete combustion:**			
(i)	around appliance location		√	√
(ii)	in appliance		√	√
3.	**CO detectors and indicators:**			
(i)	identification of detectors and indicators		√	√
(ii)	installation– locations		√	√
(iii)	commissioning and maintenance of detectors (audible, readable, visual)		√	√

KNOWLEDGE AND UNDERSTANDING		REF	I	R
1.	main constituents of complete and incomplete combustion		√	√
2.	air required for complete combustion		√	√
3.	**causes of appliance incomplete combustion at:**			
(i)	burner		√	√
(ii)	combustion space		√	√
(iii)	heat exchanger		√	√
(iv)	flue		√	√
4.	symptoms of CO poisoning		√	√
5.	advice to a person who describes symptoms of being affected by products of combustion or when indicator/detector has activated		√	√
6.	other sources of CO & CO_2 in dwellings		√	√
7.	ambient levels of CO in atmosphere		√	√
8.	levels of CO within dwellings and effect on electronic detectors		√	
9.	causes of activation of CO detectors and indicators		√	√
10.	ambient levels of CO_2 in atmosphere		√	√
11.	critical levels of CO_2 that could cause vitiation affecting combustion process		√	√
12.	movement of products of combustion within properties and its effects		√	√
13.	manufacturing standards for electronic CO detectors (alarms)		√	√
14.	identification of unsafe situation: combustion products that could enter premises.		√	√
15.	Advice to be given when a CO detector has activated	BS 7967 :2015 7.2	√	

4. Ventilation

PERFORMANCE CRITERIA		REF	I	R
1.	calculate free area of selection of air bricks (inc. terracotta types) and air vents		√	√
2.	identify correct and incorrect types of air vents and grilles e.g. fly screens		√	√
3.	identify inadequate ventilation for domestic Inputs ≤ 70 kW		√	√
4.	**calculate ventilation for domestic appliances/installation**			
(i)	combustion of domestic open flue appliances (≤ 70 kW input)			√
(ii)	compartments (domestic open, balanced and fan flue appliances ≤ 70 kW input)			√
(iii)	multi-appliance installations (multiple open flue and flueless appliances within same room/space)			√
(iv)	flueless appliance ventilation inc. cooking, water heating, and space heating			√
(v)	single and multiple DFE space heater installation, inc. flued and flueless			√
5.	identify correct and incorrect labels and notices			√
KNOWLEDGE AND UNDERSTANDING		**REF**	**I**	**R**
1.	requirements for ventilation		√	
2.	siting of ventilation (wall, window, floor, ceiling and ducted) direct to outside air, series air vents		√	
3.	restrictions to ventilator/grille locations		√	
4.	installation of ventilation grilles and vents		√	
5.	types of grilles and vents		√	
6.	adventitious air supplies		√	
7.	sizing of grilles and vents (free area availability)		√	
8.				
9.				
10.	calculating combustion air for ventilation of domestic open flue appliances		√	

11.	calculating ventilation for compartments (domestic, open, balanced and flued appliances of heat input ≤ 70 kW)		√	
12.	calculating ventilation for multi–appliance installations (multiple open flue and flueless appliances within same room/space)		√	
13.	ventilation for flueless appliances (inc. cooking, water heating and space heating)		√	
14.	ventilator location for single and multiple DFE space heater installations (inc. flued and flueless)		√	
15.	additional ventilation e.g. extractor fans, cooker hoods, driers etc.		√	
16.	labels and notices		√	
17.	effects of oil or solid fuel appliances on ventilation for DFEs		√	√
18.	identification and installation of intumescent air vents		√	√
19.	operation of passive stack ventilation		√	√
20.	ventilation for internal kitchens		√	√

5. Installation pipework and fittings
Pipe sizes: 6 mm to 35 mm

PERFORMANCE CRITERIA		REF	I	R
1.	join mild steel pipe using appropriate fittings, methods and agents	BS6891 2015: 7.6	√	
2.	join copper tube using appropriate capillary end feed fittings, methods and agents	BS6891 2015: 7.2	√	
3.	join copper tube using appropriate mechanical (compression) fittings, methods and agents	BS6891 2015: 7.3	√	
4	use temporary earth continuity bond correctly	BS6891 2015: 8.3.4	√	√
4a.	test supply for gas tightness, isolate, attach temporary earth continuity bond		√	√
4b.	disconnect meter, cap and make safe			√
4c.	cap or plug all open ends and take all general safety precautions prior to work			√
4d.	install copper capillary fitting adjacent to meter, using appropriate methods and agents			√
4e.	re-connect meter and remove temporary earth continuity bond			√
5.	check work carried out is gas tight		√	√
6.	purge meter and pipework of air. Apply any protective coating (OQ)		√	√
7.	identify installation pipework safety defects		√	√
KNOWLEDGE & UNDERSTANDING		**REF**	**I**	**R**
1.	copper pipe and fittings standards, suitability and use	BS6891 2015: 6.4, 7.2, 7.3	√	
2.	threaded fittings, mild steel pipe and fittings suitability	BS6891 2015: 6.1 6.2	√	
3	Press end connections, jointing requirements	BS6891 2015: 7.4 to 7.4.2 & MI's	√	√
4	Pliable corrugated stainless steel tubing and fittings jointing requirements	BS6891 2015: 7.2.3	√	
5	jointing and cleaning agents for copper and mild steel	BS6891 2015: 7.6.2, 7.6.3, 7.6.4	√	
6	pipe supports, clips and fixing.	BS6891 2015: 8.8 Table 4	√	
7	**requirements for pipework**			
(i)	laid in joisted floors & roof spaces	BS6891 2015: 8.9.1/2/3/4/5	√	√
(ii)	notching and drilling solid timber floor joists	BS6891 2015: 8.9. to 8.9. 9	√	√
(iii)	installed in solid floors	BS6891 2015: 8.10 to 8.10.3	√	√
(iv)	behind dry lined walls	BS6891 2015: 8.11.3	√	√
(v)	within timber/light steel frame walls	BS6891 2015: 8.11.4	√	√
(vi)	passing through a timber/light steel frame/masonry wall - accommodating	BS6891 2015:	√	√

	movement	8.20		
8	external surface mounted pipework	BS6891 2015: 8.12	√	
9	precautions when using an exposed flame when soldering joints on pipework previously containing gas and/or when a gas meter is already fitted	BS6891 2015: 8.3.5a/b/c/d/e	√	
10	restrictions on use of mechanical joints	BS6891 2015: 7.3	√	
11	Main protective bonding conductor (minimum cross sectional area)	BS6891 2015: 8.4.3	√	√
12.	Requirements for additional emergency control valves	BS6891 2015: 8.5	√	
13	ventilation for pipework in ducts	BS6891 2015: 8.16.1 to 8.16.1.4	√	√
14	**HSL56:**			
(i)	Reg.10 Maintaining electrical continuity		√	
(ii)	Reg.18 Safe use of pipes 18 (1) and (2)		√	
(iii)	Reg.19 Enclosed pipes 19 (1) to (6)		√	
(iv)	Reg.20 Protection of buildings		√	
(v)	Reg.22 Testing and purging of pipes 22 (1) to (3)		√	
(vi)	Reg.23 Marking of pipes 23 (1) and (2)		√	
15	pipe sizing for appliances – inc. theoretical exercise	BS6891 2015: A3 + Tables A1 & A5	√	√
16	fixing installation pipework when connected to a meter not securely restrained	BS6891 2015: 8.2	√	√
17	installing fire stopping in buildings containing flats or maisonettes	BS6891 2015: 8.18	√	√
18	installing pipework inside a protected area	BS6891 2015: 8.19 & Annex D	√	√
19				
20	pipework for multi-occupancy buildings	BS6891 2015: 8.17	√	√
21	minimum depth/identification of pipework buried below ground	BS6891 2015: 8.13 to 8.13.20 Table 5 + 8.14	√	√
22	pipework installed under base of wall or foundations	BS6891 2015: 8.13.21	√	√
23	use of PE pipework	BS6891 2015: 6.5 + 7.8 + 8.15	√	√
24	identify unsafe situation where installation pipe from MP meter box directly enters premises through rear meter box spigot		√	√
25	identify MP gas supply labels			√

6a. Tightness testing and purging. Total IV ≤ 0.035 m³ (LP)

Up to 1¼ (steel) and/or 35 mm (copper)

PERFORMANCE CRITERIA		REF	I	R
1.	**testing new or existing installations with gas or air:**			
(i)	visually inspect the installation to ensure joints made correctly and no open ends		√	√
(ii)	check appliances and ensure AIVs are open		√	√
(iii)	turn off the gas installation at the appropriate valve		√	√
(iv)	connect the pressure gauge to a suitable pressure test point on the installation or, if testing with air, branch of test T-piece		√	√
(v)	if using gas, carry out a let-by test of the closed supply control valve		√	√
(vi)	adjust the pressure to between 7 and 10 mbar.		√	√
(vii)	close the valve and note the gauge reading		√	√
(viii)	test for 1 minute. If pressure rises by more than 0.25 mbar, let-by may be occurring		√	√
(ix)	if pressure rise is observed, check valve by disconnecting its outlet union and applying LDF to valve barrel (OQ)		√	√
(x)	on satisfactory completion of let-by test, slowly raise the pressure in the installation to between 20 and 21 mbar		√	√

(xi)	turn off gas or air supply		√	√
(xii)	allow 1 minute stabilisation; if necessary re-adjust pressure to between 20 and 21 mbar		√	√
(xiii)	check for any perceptible movement (fall) of the gauge over the next 2 minute period		√	√
(xiv)	for new installations, or existing installations with no appliances connected check there is no pressure drop		√	√
(xv)	for existing installations, check any pressure drop is within permissible values and there is no smell of gas		√	√
(xvi)	if installation fails test, trace and repair escape and re-test installation		√	√
(xvii)	if tightness test is successful, remove pressure gauge and re-seal test point		√	√
(xviii)	when connected to gas, test pressure test point; ECV/AECV outlet connection; regulator connections and, where appropriate, MIV connections with LDF		√	√
(xix)	purge installation		√	√
(xx)	record test results		√	√
2.	locate and repair a gas escape		√	√
KNOWLEDGE & UNDERSTANDING		**REF**	**I**	**R**
1.	selection and reading of pressure gauges		√	√
2.	allowed pressure drops for existing installations related to meter size/type, pipe diameter and IV with appliances connected to gas supply and not isolated inc. E6, U6/G4, ~~U16/G10~~ and where no meter is fitted		√	√
3.	identify no perceptible movement on gauge (0·25 mbar water gauge and 0·2 mbar electronic gauge reading to 1 decimal place)		√	√
4.	allowed pressure drop for existing installation, inc. ECV but no meter is installed e.g. flat where supply is not individually metered		√	√
5.	electronic token meter tamper devices and their effect on tightness testing		√	√
6.	dealing with ECV/AECV/MIV that is letting by		√	√
7.	actions when smell of gas persists (a) after completion of satisfactory tightness test (b) when ECV/AECV/MIV is turned off, or a leaking installation cannot be repaired		√	√
8.	testing pipework of diameter > 35 mm or total IV > 0.035 m³		√	√
9.	testing prior to alteration or extension to existing installations		√	√
10.	acronyms and symbols		√	√
11.	calculating IV and PV exercise for E6, U6 and G4 meters connected to 35 mm diameter pipework ~~and U16 meters connected to any pipework of diameter ≤ 35 mm~~		√	√
12.	purging installations of IV ≤ 0.02 m³ and those of IV > 0.02 m³		√	√

6b. Tightness testing and purging. Total IV ≤ 0.035 m³ (MP)

Up to 1¼ (steel) and/or 35 mm (copper)

PERFORMANCE CRITERIA	**REF**	**I**	**R**
Tightness testing existing NG installations for 75mbar <MOP ≤ 2bar without a MIV (IGE/UP/1B Edition 3 Appendix 4 A4.3)			
1. turn off the gas installation at the ECV		√	√
2. connect the pressure gauge to a suitable pressure test point on the installation		√	√
3. carry out a let-by test of the closed ECV as follows:			
(i) adjust the pressure to between 7 and 10 mbar		√	√
(ii) operate the UPSO or excess flow valve reset to balance the pressures either side of the device, then allow it to re-shut		√	√
(iii) close the ECV and note the gauge reading		√	√
(iv) check for any perceptible movement (rise) of the gauge reading (>0.25 mbar) over the next 1 minute period		√	√
(v) if ECV is letting-by the test is suspended, installation made safe and the appropriate Gas Emergency Service Call Centre immediately notified (OQ)		√	√
4. Slowly raise the pressure in the installation to between 18 and 19 mbar by opening the		√	√

ECV then turn off the valve			

5. Allow 1minute for temperature and pressure stabilisation, if necessary re-adjust the pressure to between 18 and 19 mbar (the test shall not proceed until a stable reading is obtained)		√	√
6. Continue test as from 6a) 1 (xiii) to (xx)		√	√

7. Checking and/or setting meter regulators

PERFORMANCE CRITERIA		REF	I	R
1.	Turn all appliances off		√	√
2.	zero pressure gauge and connect to meter test point		√	√
3.	observe and record standing pressure at test point		√	√
4.	turn on gas appliances and, dependent on appliances available, operate as follows: • boiler - full rate • space heater - full rate • cooker - 3 hotplate burners on full rate • other appliances - full rate		√	√
5.	read and record OP on gauge (21 mbar) Note: supplementary oral question/s on:		√	√
(i)	effects of pressure absorption across primary meter installation		√	√
(ii)	effects of low and high flow rates on regulator outlet pressures (19 – 23 mbar)		√	√
6.	**if reading is incorrect:**			
(i)	notify GT where pressures are outside 19 – 23 mbar range		√	√
(ii)	apply procedure for an AMI for re-setting and sealing meter regulator		√	√
7.	remove gauge; re-seal test point and test for gas tightness		√	√
KNOWLEDGE AND UNDERSTANDING		**REF**	**I**	**R**
1.	reading pressure gauges		√	
2.	operation of a gas meter regulator		√	
3.	HSL56: Reg.14 Regulators 14(1), (5), (6), (7)		√	

8. Unsafe situations, use of emergency notices and warning labels

PERFORMANCE CRITERIA		REF	I	R
1.	identify unsafe situations as ID & AR		√	√
2.	identify and label defective installation(s)		√	√
3.	identify what and when to report under RIDDOR		√	√
KNOWLEDGE AND UNDERSTANDING		**REF**	**I**	**R**
1.	explain dealing with ID installations/appliances		√	√
2.	explain dealing with AR installations/appliances		√	√
3.	explain dealing with AR installations/appliances when turning off does not remove the risk		√	√
4.	explain dealing with situations that do not meet current standards but are not unsafe		√	√
6.	**identify correct notices and labels to be used:**			
(i)	MP supply		√	
(ii)	warning notice forms		√	
(iii)	advisory notices, electrical bonding		√	
7.	situations reportable under RIDDOR: explain reporting to HSE		√	√
8.	HSL56: Reg.15 Meters – emergency notices 15 (1) to (2)		√	
9.	**GIUSP:**			
(i)	overall scope		√	√

(ii)	gas incidents		√	√

9. Operation and positioning of ECV/isolation controls and valves

PERFORMANCE CRITERIA		REF	I	R
1.	identify incorrectly positioned valves			√
2.	identify correctly positioned valves			√
3.	demonstrate dealing with incorrectly positioned valves			√
4.	identify correct labels and attach to valves			√
KNOWLEDGE AND UNDERSTANDING		**REF**	**I**	**R**
1.	inside meter positions		√	
2.	outside meter positions		√	
3.	multi-occupancy installations-external risers		√	
4.	multi-occupancy installation-internal risers		√	
5.	multi-occupancy installation-remote meters		√	
6.	types of isolation valves used in multi-occupancy meter installations (AECVs etc.)		√	√
7.	HSL56: Reg.9 (1) to (4) inclusive		√	

12. Chimney Standards

KNOWLEDGE AND UNDERSTANDING		REF	I	R
Where solid fuel chimneys can be visually inspected without removal of an appliance:				
1.	operation of dampers and restrictor plates		√	
2.	catchment spaces and standard dimensions / volumes		√	
3.	effects of other fuels on chimneys and need for cleaning		√	
4.	fitting bird guards to chimneys		√	
5.	suitable and unsuitable terminals for space heaters inc. radiant, inset and DFE		√	
Chimneys for individual open flue natural draught appliances:				
1.	construction and operation of a chimney		√	√
2.	types of chimney material – cement based and metallic		√	
3.	methods of jointing chimney components		√	
4.	termination positions for chimney outlets		√	√
5.	ridge terminal positions		√	
6.	restrictions to siting bends and lengths of chimney run to avoid condensation		√	
7.	sealed compartments for open flue appliances		√	√
8.	additional safety requirements when fans are installed in secondary flues		√	√
9.	passive stack ventilation systems in houses, where open flue natural draught appliances are fitted		√	√
Condensing flues:				
1.	condensate disposal position and termination for appliances of heat input ≤ 4 kW		√	√
2	plume management kits		√	√
Pre-cast flue systems:				
1.	pre-cast flue design		√	
2.	adapters for connecting open flues into pre-cast flues		√	

3.	termination procedures for pre-cast flues		√	
4.	flueing through loft spaces		√	
Room sealed natural draught and fanned draught chimney configurations for appliances:				
1.	balanced flue systems natural and fanned draught		√	
2.	balanced flue natural and fan assisted terminal positions, restrictions for chimney outlet positions inc. horizontal and vertical configurations		√	√
3.	restrictions on lengths, bends etc. for fanned draught room sealed flue appliances		√	
4.				
5.	enclosing chimneys		√	√
6.	proximity of flue duct outlets to boundaries		√	√
7.	identify unsafe situation 'A room sealed flue system installed within an~~d~~ enclosure without the means of an inspection facility'		√	√
8.	shared flue systems, SE ducts and U ducts: construction and operation of SE–ducts, U–ducts and CFS		√	√
9.	**HSL56:**			
(i)	Reg.27 Flues (1) to (4)		√	
(ii)	Reg.30 Room-sealed appliances (1) to (3)		√	
(iii)	Reg.32 Flue dampers (2) and (3)		√	

15. Re-establish existing gas supply and re-light appliances

PERFORMANCE CRITERIA		**REF**	**I**	**R**
1.	re-establish gas supply		√	√
2.	check installation is gas tight		√	√
3.	**check appliance(s) visually and re-light inc.:**			
(i)	purge system and appliances of air		√	√
(ii)	light appliance(s)		√	√
(iii)	confirm satisfactory operation of user controls		√	√
(iv)	visually inspect appliance installation(s) for unsafe situations		√	√
KNOWLEDGE AND UNDERSTANDING		**REF**	**I**	**R**
1.	describe action when an un-commissioned appliance is identified		√	
2.	confirm actions if pipework and appliance(s) are not tested (commissioned) when gas supply is re-established		√	
3.	HSL56: Reg.33 Testing of appliances 33(1) to (3)		√	