



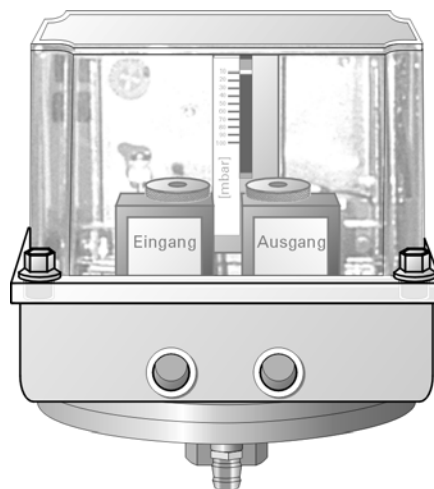
Valve Proving System for Automatic Shut-Off Valves

Type **AD 2 H 1...**

Maximum service pressure 100 mbar

Type **AD 2 H 5...**

Maximum service pressure 500 mbar



Features

- Compact unit with a new technology, complete with control valves, programme logic and pressure sensing system
- Designed according to DIN EN 1643, DVGW-approved
- Valve proving requires no opening of same
- Proving times are short and may be set individually to suit different valve sizes
- DVGW-approved for natural gas, propane and manufactured gas

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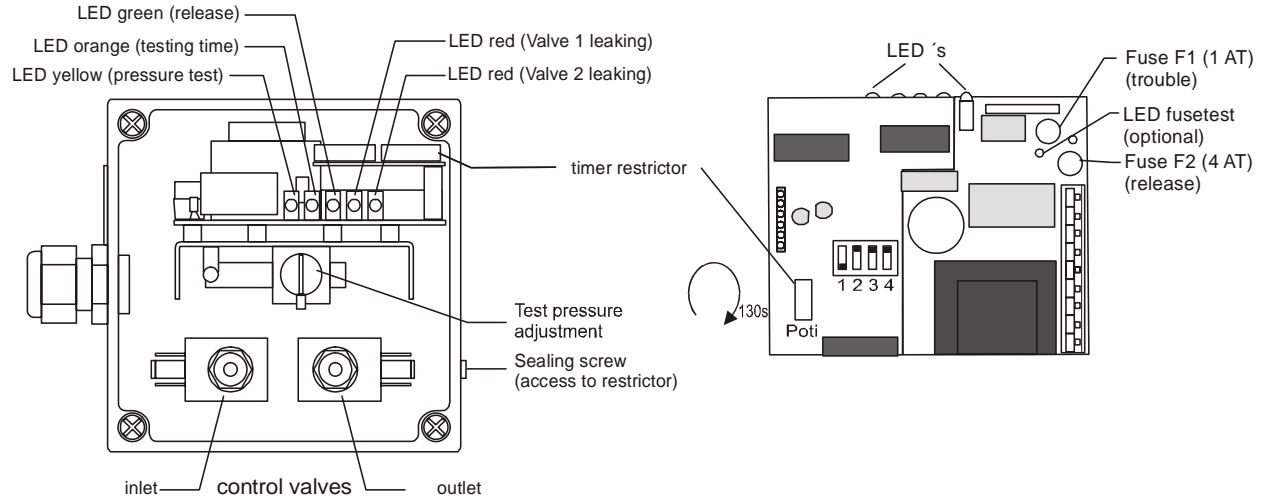
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Note

- ***Please read this manual and adhere to it when making use of the device***
- ***Installation and maintenance procedures may only be carried out by authorized personnel***
- ***All local regulations and the prevailing codes of practice must be observed during installation.***
- ***Improper installation, alignment and maintenance, as well as modifications by the customer, can all lead to personal injury or property damage, as well as loss of warranty!***

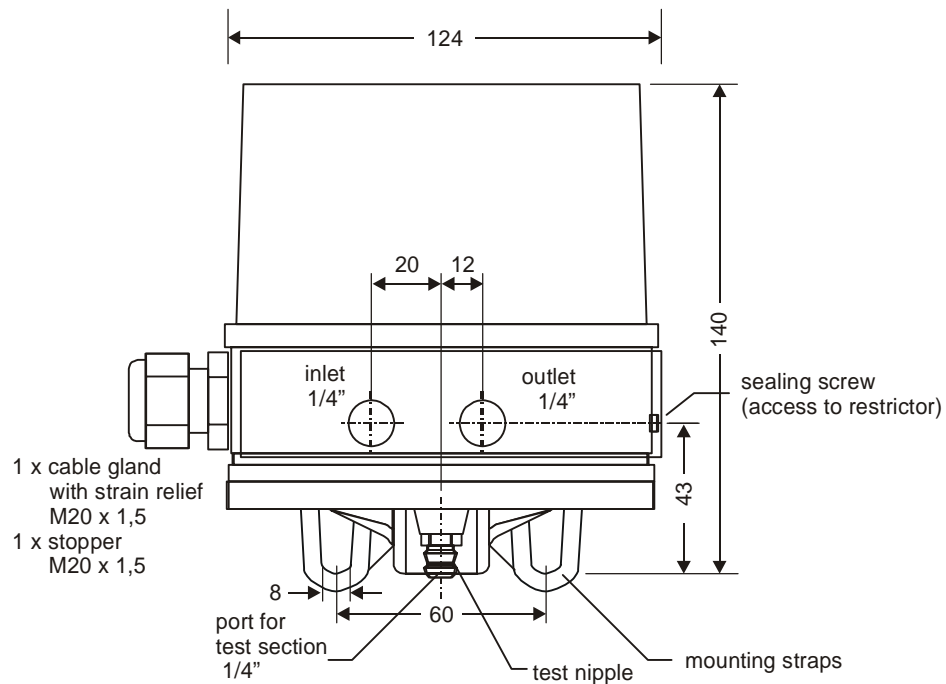
3. Construction

The programme logic and the pressure sensor with the control valves is housed underneath a transparent cover. The pressure sensor system consists of a membrane, 2 microswitches with switching rocker and a pressure adjustment dome with scale. The programme logic includes the timer and the status indicators (LEDs).



Control elements

Printed circuit with timer (side view)

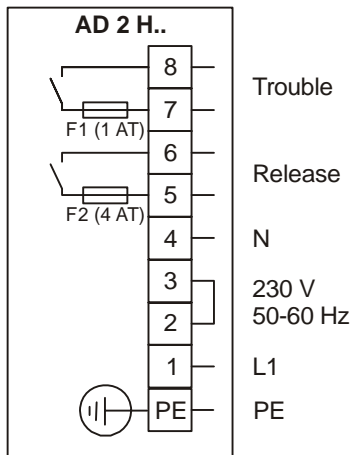


Side view

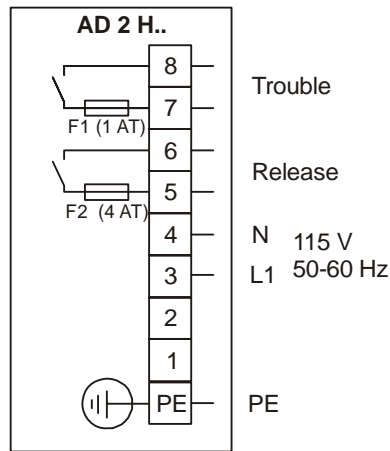
4. Electrical connection

AD 2 H...

Supply voltage: 230 V ~

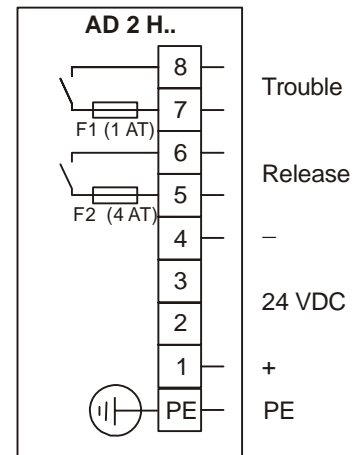


supply voltage: 115 V ~



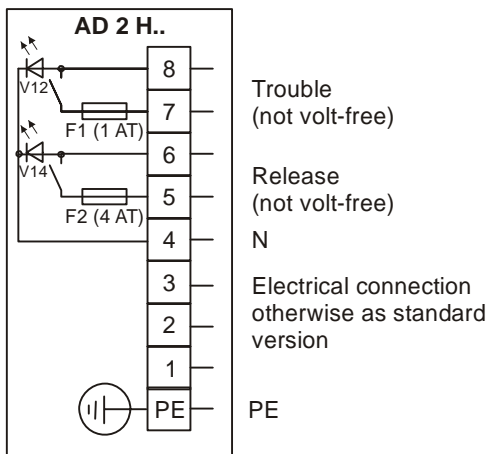
AD2H.../_ _ _ _ 6

supply voltage: 24 V DC



Remove jumper between terminals 2 -3

AD2H.../_ _ C _ _



With this version the fuses may be checked with LEDs. Unit must be in trouble position (close the main gas cock and start the system). The LEDs will only come on if terminals 5 and 7 are energized by the BMS and burdens (e.g. relays) have been connected to terminals 6 and 8.

Note:

- The release contact or "valves proved" contact should only be wired into the burner management start-up circuit!
- The trouble or „fault“ contact should only be used for remote indication, not as part of burner safety logic

A quick blowing 6A fuse has to be installed at site

5. Storage, operation and lifetime

The units shall be stored in a dry and dust-free place. Ambient temperature during storage shall be 0 – 60°C. No operation and storage below dew point. Moisture must not exceed 60%. The unit protected from mechanical damages.

With its 2 integrated by-pass valves the valve proving systems checks the thightness of 2 safety shut off gas valves mounted in series. These main valves (valve 1 and valve 2, see principal installation) are not activated during the testing procedure.

The valve proving system should be integrated into the burner management system in such a way that a tightness check is carried out every time the safety shut off valves (main valves) are activated, i.e. a burner start-up is avoided in case of unpermissible gas leakage.

This implies that a trouble lockout is not carried out by the valve proving system itself but has to be effected by the burner management system.

The valve proving system sequence is started by energizing the supply voltage.

The valve proving system checks the tightness of 2 safety shut off gas valves mounted in series. The valve proving principle is based on pressure changes in the pipe space between the gas valves (the test section) using the line gas pressure as the test medium which enters or leaves the test section via a restricting orifice. Thus the restricting orifice determines the test time and limits the volume of gas which is allowed to enter the furnace chamber at any time.

The built-in timer closes the internal control valves when the adjusted time has elapsed and ends the proving procedure. The maximum time adjustment for this timer is 130 seconds. A "valves proved" signal will not be given to the burner management if the time has elapsed before the valve proving cycle is complete. The shortest adjustable proving time is 1 second.

If the mains voltage is interrupted while a leakage is reported, the valve proving system will start a new proving cycle as soon as it is re-energized.

A new valve proving cycle is effected by isolating the mains terminals and then re-energizing them.

The time span between two proving cycles must not be shorter than 3 seconds. This will allow the system to return to its starting position.

Safety related equipment! In case of a break down the unit has to be returned to the manufacturer for inspection.

The device has a limited service life. It is designed for appr. 250,000 start ups. For 50 start ups per day its lifetime would be about 10 years. This time decreases under bad conditions e.g. dust, high or low temperature, moisture, aggressive gases. The end user shall therefore take care that regular safety related maintenance checks are carried out at site.

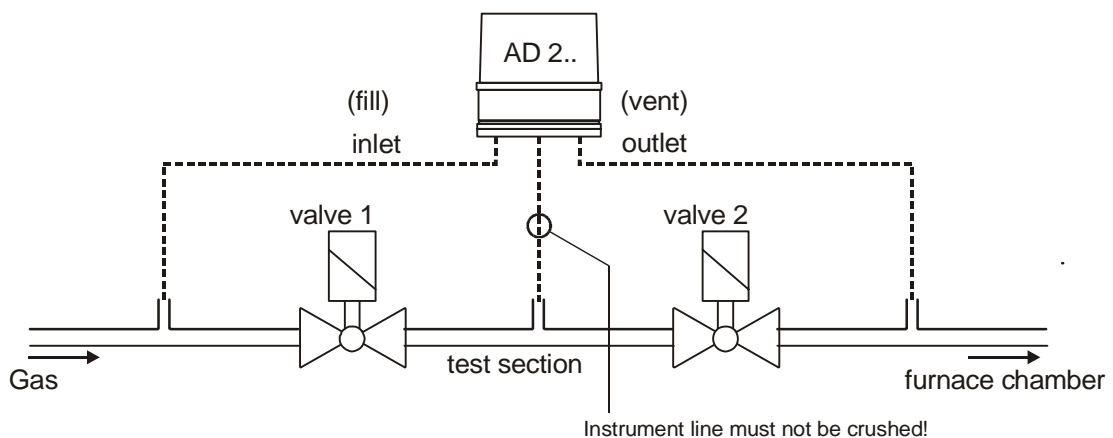
When the appliance has reached the end of its lifetime it must be disposed of according to local regulations.

6. Installation

General

In order to avoid the ingress of foreign matter a sieve has to be installed upstream of the valve proving system. Its mesh width must not exceed 1.5mm in diameter and 1mm test pin must not penetrate.

Principal Installation



The valve proving unit and the 2 valves (valve 1 and 2) should be installed closely together to keep the test volume small and thus the testing time as short as possible. The unit can be mounted either with its fixing straps or on the ¼"-pipe to the test section.

The test line (instrument line) shall be sturdy enough to prevent crushing.

Connect the instrument lines "inlet, outlet, test section" as shown. The inlet and outlet ports are interchangeable if this should be necessary because of the pipework. Loosen the knurled screws and change the coil of the control valves without disconnecting the wires.

PLEASE NOTE: In case of furnace back pressure the test section has to be vented into open atmosphere outside the building!

7. Adjustment

7.1 Adjusting the test pressure

Please note: Do not set the pressure to any value lower than 98%. Otherwise the system might not be able to detect the lowest leakage.

Set the test pressure to 98% of the line gas pressure.

The setting of the pressure depends on burner's heat release. See attachment '10.1 Pressure setting'. The valve proving system is delivered factory-set to the highest possible value. This ensures that the commissioning engineer is required to set the system to a proper value after installation.

- Release the gas supply (e.g. open the main gas cock)
- Check if the line pressure is available at the valve proving system
- Switch the valve proving system AD2... on
- Before the testing time expires: Turn the setting screw counter-clockwise until the yellow LED (orange) goes out.

Test the pressure setting with a pressure gauge connected to the test nipple (open worm screw in the test nipple by 2-3 turns). Switch the valve proving system on again and check if the yellow LED goes out once the line pressure has been reached.

Please note: Do not set the pressure to less than 98%. Otherwise the system might not be able to detect the highest permissible leakage rate. The test pressure settings made out in attachment "10.1 Setting the test pressure" is applicable only if the burner's heat release exceeds 1 MW. A reduction of the test pressure setting allows the adaptation to fluctuations in the line pressure or extremely long testing times resulting from large test volumes.

7.2 Testing procedure

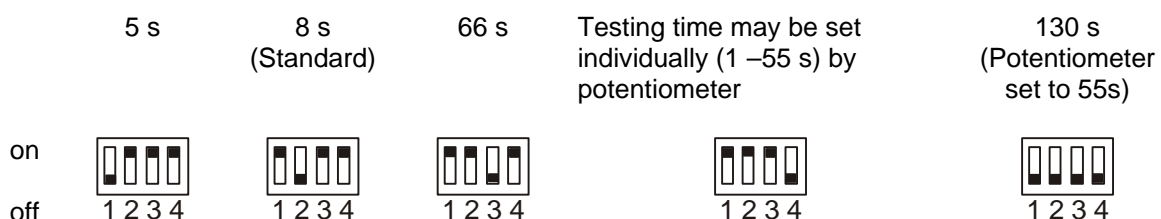
The testing time depends on the volume of the test section between the 2 valves, the line pressure, the setting of the test pressure and the orifice bore. The test procedure is indicated by a yellow LED, the total testing time by an orange LED.

Adjustment of Testing Time

(See section 3 - printed circuit with timers and potentiometer)

Testing Time

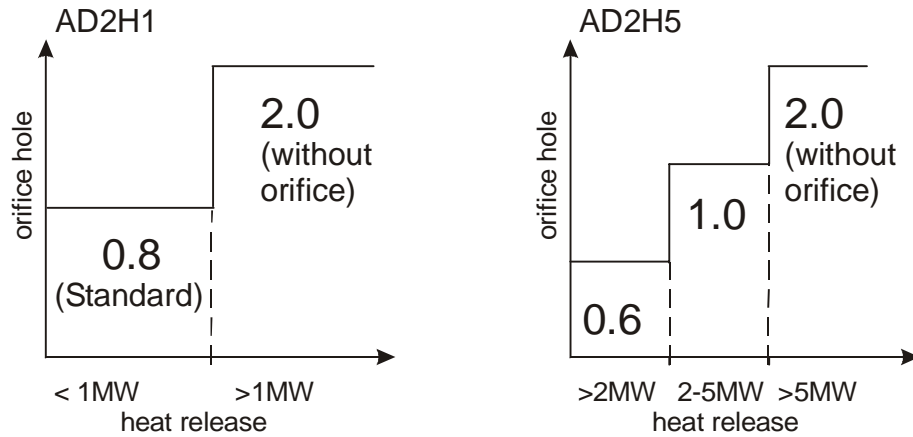
The time limit is factory set to 8 seconds. In case the valves have been proved tight, the release signal and the green LED will come on. If the valve check is completed in less than 8 seconds, the release signal will nevertheless come on only after the testing time has elapsed. There will be no release if the time setting is too short. In this case one of the red LEDs will come on. The setting of the testing time has to be adapted to the time actually required and then be optimized with one of the settings shown below.



Note: Further variations of the testing time can be effected by combining the switch position.

Selecting the right orifice

The system is factory fitted with a small orifice according to the table underneath. With the bore stated there the smallest permissible leakage is safety detected even at the highest supply pressure. The valve proving system can thus be installed in any plant and be operated at its highest service pressure. Should the testing time become unduly long because of a large test section volume, the orifice can be optimized by enlarging its bore, depending on the burner's heat release.



<p align="center">AD 2 H 1 built in orifice Ø 0,8 mm</p>	<p align="center">AD 2 H 5 built in orifice Ø 0,6 mm</p>
<p>larger than 1 MWremove the orifice (the passage is now 2.0 mm)</p>	<p>2 - 5 MW..... Ø = 1 mm larger than 5 MW remove the orifice (the passage is now 2.0 mm)</p>
<p>Example: Test section volume..... 4 litre Supply pressure.....100 mbar Switching threshold 98 mbar</p> <p>Resulting testing times (filling + venting): With orifice Ø 0,8 mm= appr. 24 sec. Without orifice.....= appr. 8 sec.</p>	<p>Example: Test section volume..... 4 litre Supply pressure..... 500 mbar Switching threshold..... 490 mbar</p> <p>Resulting testing times: With orifice Ø 0,6 mm = appr. 120 sec. With orifice Ø 1,0 mm = appr. 40 sec. Without orifice = appr. 20 sec.</p>

8. Proving results and troubleshooting

8.1 LED green (Release) on

Valve proving procedure has been completed. Subsequent controls have been released. Contact 5 – 6 is closed.

8.2 LED red (valve 1 leakage)

Possible Causes	1. Valve 1 leakaging	1.1	Check valve 1 for possible leakage
	2. Test section cannot be vented	2.1	Back pressure from furnace
		2.2	Venting line blocked or crushed
		2.3	Selected testing time too short

8.3 LED red (valve 2 leakage)

Possible Causes	1. Valve 2 leakaging	1.1	Check valve for possible leakage
	2. Test section cannot be filled	2.1	No line pressure (e.g. main gas cock closed)
		2.2	Testing pressure set higher than actual line pressure
		2.3	Filling line blocked or crushed
		2.4	Selected testing time too short
	2.4.1	If the testing time is already set to its maximum value adapt orifice bore to the burner's heat release (see chapter 7)	

9. Approvals

CE 0085



EG-Baumusterprüfbescheinigung

EC type examination certificate

CE-0085BO0370

 Produkt-Identnummer
 product identification no.

Anwendungsbereich <i>field of application</i>	EG-Gasgeräterichtlinie (90/396/EWG) <i>EC Gas Appliances Directive (90/396/EEC)</i>
Zertifikatinhaber <i>owner of certificate</i>	Hegwein GmbH & Co. KG Am Boschwerk 7, D-70469 Stuttgart
Vertreiber <i>distributor</i>	Hegwein GmbH & Co. KG Am Boschwerk 7, D-70469 Stuttgart
Produktart <i>product category</i>	Ausrüstungsteile für Gas- und Druckgeräte: Dichtheitskontrolleinrichtung (4115)
Produktbezeichnung <i>product description</i>	Ventilüberwachungssystem für automatische Absperrventile mit zwei internen Ventilen und zwei Druckschaltern
Modell <i>model</i>	AD 2 H...
Bestimmungsländer <i>countries of destination</i>	AT, BE, DE, DK, ES, FI, FR, GB, GR, IE, IS, IT, LU, NL, PT, SE
Prüfberichte <i>test reports</i>	Baumusterprüfung: C-P 1165-00/03 vom 09.10.2003 (TSG)
Prüfgrundlagen <i>basis of type examination</i>	EU/90/396/EWG (29.06.1990) DIN EN 1643 (01.02.2001)

Aktenzeichen 03-0496-GEE
file number

04.11.2003 File A-7/2
 Datum, Bearbeiter, Blatt, Titel der Zertifizierungsstelle
 date, issued by, sheet, head of certification body

DVGW-Zertifizierungsstelle - von der Deutschen Bundesregierung benannte und von der Europäischen Kommission offiziell registrierte Stelle für die Konformitätsbewertung von Gasgeräten

DVGW Certification Body - notified by the government of the Federal Republic of Germany and officially registered by the European Commission for conformity assessment of gas appliances



ZLS-ZE-349/03

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 des Gas- und Wasserfaches e.V.
 Technisch-wissenschaftlicher
 Verein

 Zertifizierungsstelle
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 Telefon +49 (228) 91 88 807
 Telefax +49 (228) 91 88 993

A-2/2

Elektrische Daten: 115 V AC, 50/60 Hz, P = 15 VA, IP54
electrical data 230 V AC, 50/60 Hz, P = 15 VA, IP54

Typ type	Technische Daten technical data	Bemerkungen remarks
AD 2 H...	max. Betriebsdruck: 0,1/0,5 bar	

Ausführungsvariante type variation	Erläuterungen explanations
AD 2 H1	max. Betriebsdruck: 100 mbar
AD 2 H5	max. Betriebsdruck: 500 mbar
AD 2 ...C...	mit LED für Sicherheitsausfallanzeige

Verwendungshinweise / Bemerkungen hints of utilization / remarks
Umgebungstemperaturbereich: -10...+60 °C



**EG-Konformitätserklärung
EC Declaration of Conformity**

Hersteller Manufacturer	Hegweйн GmbH & Co. KG
Anschrift Address	Am Boschwerk 7, 70469 Stuttgart
Produktbezeichnung Product description	Ventilüberwachungssystem AD2H... Valve proving system AD2H...

Das bezeichnete Produkt stimmt mit den Vorschriften folgender europäischer Richtlinien überein, vorausgesetzt, daß es installiert, gewartet und entsprechend seiner Bestimmung eingesetzt wird. Die einschlägigen Vorschriften und Hinweise aus der Bedienungsanleitung sind zu beachten.

The described product complies with the following provisions of Council Directive, provided that it is installed, maintained and used in applications for which it was made, in accordance with relevant installation standards and manufacturer's instructions.

Richtlinie des Rates 90/396/EWG (Gasgeräte-Richtlinie)
Council Directive 90/396/EEC (Gas appliance directive)

Richtlinie des Rates 89/336/EWG (EMV-Richtlinie)
Council Directive 89/336/EEC (EMC Directive)

Richtlinie des Rates 73/23/EWG (Niederspannungsrichtlinie)
Council Directive 73/23/EEC (Low Voltage Directive)

Wir bestätigen die Konformität des oben bezeichneten Produkts mit folgenden Normen:
We confirm the conformity of the above mentioned product with the following standards:

EN 60730-1	EN 55022
EN 50081-1	ENV 50204
EN 1643	

Aussteller Issuer	Hegweйн GmbH & Co. KG
------------------------------	-----------------------

Ort, Datum Place, date	Stuttgart, 13.06.2003
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**Rechtsverbindliche
Unterschrift
Legally binding
signature**

(Dr.-Ing. U. Greul)

KONFAD2

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Prof. Dr.-Ing. Peter Martin (Vorsitzender),
Dr.-Ing. Ulrich Greul

DURAG GROUP
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and Combustion*

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10. Attachement

10.1 Setting Test Pressure

The minimum leakage result (see DIN EN1643) depends on the burner's heat release and has therefore to be adapted accordingly. Set the test pressure as outlined in the tables below.

AD2H1

Burner heat release [MW]	orifice 0,8mm	orifice 2,0mm
	Pressure adjustment [%]	Pressure adjustment [%]
0 - 1,0	98	-
> 1,0 - 1,5	90	98
> 1,5 - 2,5	80	90
> 2,5 - 3,5	-	80
> 3,5 - 5	-	70
> 5	-	60

AD2H5

Burner heat release [MW]	orifice 0,6mm	orifice 1,0mm	orifice 2,0mm
	Pressure adjustment [%]	Pressure adjustment [%]	Pressure adjustment [%]
0 - 2	98	-	-
> 2 - 4	90	98	-
> 4 - 5	80	90	98
> 5 - 6	-	80	90
> 6 - 9	-	-	80
> 9	-	-	70

Please note any changes of the orifice bore will lead to change of the testing time, as outlined under 7.2.