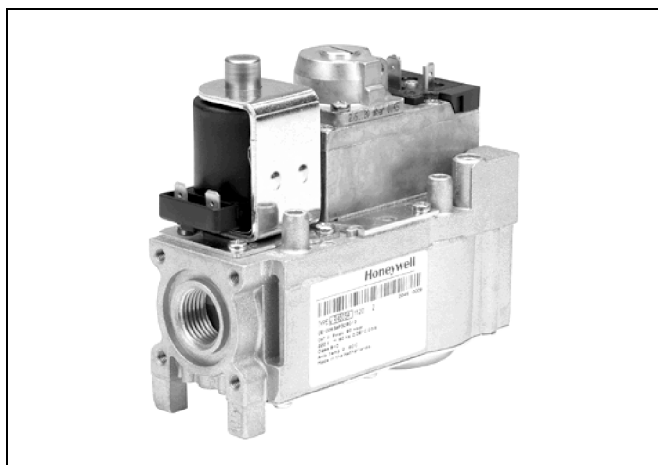


VR46../VR86.. SERIES

COMPACT COMBINATION GAS CONTROLS WITH SERVO PRESSURE REGULATION FOR AUTOMATIC IGNITION SYSTEMS

INSTRUCTION SHEET



DESCRIPTION

VR46../VR86.. combination gas controls perform all the functions required to safely regulate gas flow to the pilot burner and the main burner of domestic central heating equipment, warm air furnaces, back boilers, water heaters and radiant tube heaters.

VR46../VR86.. combination gas controls comprise a standard body to which a range of sub assemblies are factory fitted to give various system options. Options include servo pressure regulation, (switchable) softlite, electrical high-low control and electrical or mechanical modulation.

VR46../VR86.. combination gas controls consist of a first direct electric ON/OFF operator for opening the safety valve of class A or B according to EN 161 and a second electric ON/OFF servo operator valve for opening the main valve of class B, C or J according to EN 161.

APPLICATION

VR46../VR86.. combination gas controls have been specially developed for application in domestic and small commercial atmospheric appliances with automatic ignition. VR46../VR86.. combination gas controls are used in a system context in conjunction with either a direct spark ignition (DSI) or intermittent pilot (IP) control module and associated devices to provide programmed safe light-up and supervision of the main burner of an appliance.

VR46../VR86.. combination gas controls are intended to be used for manufactured, natural and LP gases (1st, 2nd, 3rd family gas).

VR46../VR86.. combination gas controls are approved in accordance with existing european standards.

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SPECIFICATIONS

Models

VR46.. series line voltage

VR86.. series low voltage

VR4601/VR8601 series:

two automatic shut off valves with pilot gas connection between the valves for intermittent pilot (IP) applications.

VR4605 /VR8605 series:

two automatic shut off valves for direct spark ignition (DSI) or hot surface ignition (HSI) applications.

NOTE:

Single suffix letter indicates:

medium capacity series.

Suffix letter followed by an "A" indicates:

low capacity series.

Suffix letter followed by a "B" indicates:

high capacity series.

Suffix letter

A: fast opening, with regulator

B: fast opening, without regulator

C: slow opening, with regulator

D: slow opening, without regulator

H: slow opening, with Modulec

M: fast opening, with Modureg

N: slow opening, with Modureg

P: fast opening, with High-Low

Q: slow opening, with High-Low

R: fast opening, with regulator and suitable in gas/air control systems

Dimensions

See fig.1., page 25

Pressure regulator

Class B according to EN 88

Pipe sizes

- Inlet and outlet 1/2" ISO 7-1 internal parallel pipe thread.
- Inlet 1/2" ISO 7-1 internal parallel pipe thread and outlet Ø18.6 mm.
- Inlet Ø18.6 mm and outlet 1/2" ISO 7-1 internal parallel pipe thread.
- Inlet and outlet Ø18.6 mm.
- Inlet 1/2" ISO 7-1 internal parallel pipe thread and side outlet Ø14 mm.
- Inlet and outlet Ø 23 mm bore.
Inlet and outlet can also be fitted with straight or elbow flanges.

Pilot gas connection (where applicable)

4 mm or 6 mm outer diameter tubing.

Special connection (optional): incorporated in the side outlet.

Pressure feedback connection

Servo pressure regulator has an M5 threaded hole to make connection between regulator and combustion chamber of the appliance.

Ambient temperature

VR46../VR86..xA: 0 ... 60°C (except for dedicated types which have 0 ... 70°C)

VR46../VR86..x: 0 ... 60°C

VR46../VR86..xB: 0 ... 60°C

Minimum regulation capacity

VA types: 0,5 m³/h

Minimum differential pressure at 0.31 m³/h air

Model*	mbar
VR4601/VR8601x VR4605/VR8605x	1.7
VR4611/VR8611x VR4615/VR8615x	3.9
VR4621/VR8621x VR4625/VR8625x	3.9
VR4631/VR8631x VR4635/VR8635x	1.7
VR4641/VR8641x VR4645/VR8645x	3.9
VR4641V/VR8641V VR4645V/VR8645V	3.9
VR4601/VR8601xA VR4605/VR8605xA	1.8
VR4611/VR8611xA VR4615/VR8615xA	3.9
VR4621/VR8621xA VR4625/VR8625xA	3.9
VR4631xA/VR8631xA VR4635xA/VR8635xA	1.8
VR4601xB VR4605xB	1.7
VR4611xB/VR8611xB VR4615xB/VR8615xB	3.9
VR4601EB/VR8601EB VR4605EB/VR8605EB	1.3
VR4601TB/VR8601TB VR4605TB/VR8605TB	1.3
VR4611VB/VR8611VB VR4615VB/VR8615VB	3.9

* x = suffix letter

Valve classification

Type	Class	
	1 st valve	2 nd valve
VR4601/VR8601 VR4605/VR8605	B	J
VR4611/VR8611 VR4615/VR8615	B	C
VR4621/VR8621 VR4625/VR8625	B	B
VR4641/VR8641 VR4645/VR8645	A	C

Enclosure

IP 40 when used with covers or plugs

IP 44 when used with plugs according to DIN 43650

Timing

Closing time: 1 s

Dead time:

- fast opening models: 1 s max.
- fast opening models with second valve class B max 0.55 s
- slow opening models: see table 1.

Opening time:

- fast opening models: 1 s from start of flow till 50% of outlet pressure setting.
- fast opening models with second valve class B: 1 s from start of flow till 7 mbar outlet pressure.
- Slow opening models: 1.5 s from start of flow till Softlite pressure

Table 1:

Gas	Inlet pressure (mbar)	Dead time (s)
G 20/G 25	20	1.5 max.
G 30/G 31	37	1.8 max.
G 30/G 31	50	1.5 max.

Maximum operating pressure

The P_{max} indication on the housing is the maximum inlet pressure at which the combination gas control functions safely. However the maximum operating pressure is limited by the pressure range of the pressure regulator concerned (see table 2.).

Table 2: Maximum operating pressure

Model	Pressure range (mbar)	Maximum operating pressure (mbar)
with regulation	2 ... 10 2.5 ... 20	30
	3 ... 37*	45
	5 ... 50*	60
	10 ... 60*	100
without regulation	-	60
with throttle	-	60

- * This type can also be used for non regulation mode in LP applications when pressure regulator adjustment screw is clockwise turned down until it stops.

Mounting holes

Two M5 mounting holes are located on the bottom of the combination gas control.

The four holes at inlet and outlet side for mounting the flange to the combination gas control are provided with M5 thread with min. 6.5 mm full thread.

Capacity

See table 3.

Capacity curves are available on request.

Electrical rating

See table 4.

Table 3: Capacity (in m³/h air)

Model*	ΔP (mbar)	
VR4601/VR8601x VR4605/VR8605x	3	3.1
VR4611/VR8611x VR4615/VR8615x	5	3.0
VR4621/VR8621x VR4625/VR8625x	5	3.0
VR4631/VR8631x VR4635/VR8635x	3	2.1
VR4641/VR8641x VR4645/VR8645x	5	1.8
VR4641V/VR8641V VR4645V/VR8645V	10	5.4
VR4601/VR8601xA VR4605/VR8605xA	3	2.1
VR4611/VR8611xA VR4615/VR8615xA	5	1.8
VR4621/VR8621xA VR4625/VR8625xA	5	3.5
VR4631/VR8631xA VR4635/VR8635xA	3	2.1
VR4601/VR8601xB VR4605/VR8605xB	3	4.2
VR4611/VR8611xB VR4615/VR8615xB	5	4.6
VR4601/VR8601EB VR4605/VR8605EB	3	4.2
VR4601/VR8601TB VR4605/VR8605TB	3	4.2
VR4601/VR8601VB VR4605/VR8605VB	3	4.6

* **x = suffix letter**

Table 4: Electrical rating

Nominal voltage	Power consumption at nominal voltage (W)			Current at nominal voltage (mA)		
	1 st operator (large coil)	1 st operator (small coil)	2 nd operator	1 st operator (large coil)	1 st operator (small coil)	2 nd operator
24 V, 50 Hz	7	3.5	3.8	450	280	211
24 V, 60 Hz	8.3	4.9	4.7	550	400	266
230 V, 50 Hz	8.3	4.8	4	60	42	23
220 V, 60 Hz	8.3	4.9	3.5	57	45	21.1

INSTALLATION

IMPORTANT

Take care that installer is a trained experienced service person.

Turn off gas supply before starting installation.

Disconnect power supply to prevent electrical shock and/or equipment damage.

Do not remove seals over inlet and outlet until the device is ready to be installed.

If M5 connection for switchable softlite and/or pressure feedback is/are not to be used, it is to recommend to push a dust cap into the hole.

Mounting position

The combination gas control can be mounted 0 to 90° in any direction from the upright position, i.e. from the position when electric operators are on top.

Main gas connection

- Take care that dirt cannot enter the combination gas control during handling.
- Use a clean taper fitting with thread according to ISO 7-1 or a piece of new, properly reamed pipe, free from swarf.
- Do not tighten the pipe or pipe fitting too far (see table below). Otherwise valve distortion and malfunction could result.

Pipe size	Max. length of pipe thread
1/2"	18.6 mm

- Apply a moderate amount of good quality thread compound to the pipe or fitting only, leaving the two end threads bare. PTFE tape may be used as an alternative.
- Ensure that gas flows in the same direction as the arrow on the bottom of the combination gas control.

Pressure feedback connection



WARNING

To avoid decreasing of performance of pressure regulator by pinching-off the pressure feedback tubing, it is to recommend a metal tubing.

Pilot gas connection (VR4601/VR8601 only)

- Square off the end of tubing and remove burrs.
- Slip compression fitting over tubing.
- Insert tubing into housing of combination gas control until it bottoms, slide fitting into place and turn finger tight.

- Use a wrench to tighten fitting about 2 turns beyond finger tight for 6 mm tubing and about 3/4 turn beyond finger tight for 4 mm tubing to make a pressure tight joint. Do not use jointing compound.
- Connect other end of tubing to pilot burner according to the pilot burner manufacturer's instructions.



WARNING

Do not bend tubing at combination gas control after compression fitting has been tightened, as this may result in gas leakage at the connection.

Remember that length of pilot tubing and pilot burner characteristics have influence on time to ignite pilot burner. This can interfere with available ignition timings.

Electrical connection



CAUTION

Switch off power supply before making electrical connections.

Take care that wiring is in accordance with applicable codes and local regulations.

To ensure a safe closing of the valve, it is essential that the voltage is reduced to 0 Volt.

Ensure that cut-off function of limit control de-energizes both valves.

Use lead wire which can withstand 105°C ambient.

The electric on/off operator is provided with:

6.3 mm quick connect terminals suitable for 6.3 mm receptacles. (e.g. "Series 250" AMP fasteners)

The electric servo on/off operator is provided with:

6.3 mm quick connect terminals suitable for 6.3 mm receptacles. (e.g. "Series 250" AMP fasteners)

or with:

quick connect terminals suitable for a female connector according DIN 43650.

Wiring combination gas controls in intermittent pilot (IP) systems

The appliance manufacturer's instructions should always be followed when provided. If not available see fig. 2. page 27 for typical systems using Honeywell S458 ignition control.

Wiring combination gas controls in direct spark ignition (DSI) systems

The appliance manufacturer's instructions should always be followed when provided. If not available see fig. 3. page 27 for typical systems using Honeywell S4560 automatic ignition control.



WARNING

Tightness test after installation

Paint all pipe connections and gaskets with a strong soap and water solution.

Start the appliance and check for bubbles. If a leak is found in a pipe connection, remake the joint. A gasket leak can usually be stopped by tightening the mounting screws. Otherwise, replace the gasket.

Be careful not to clog bleed vent parts with soap solution residue. Remember bleed vents will discharge air during gas valve opening or closing giving false indication of leakage.

ADJUSTMENTS, CHECKOUT AND MAINTENANCE



WARNING

Adjustments must be made by qualified persons only. If the appliance manufacturer supplies checkout and/ or service and maintenance instructions carefully follow them. If these instructions are not provided then use the procedure outlined below.

Pressure tap

The combination gas control is provided with a pressure tap of 9 mm outer diameter at inlet and outlet side. When checking the pressure undo the screw a half turn and slip tube over nipple.

Ensure that screw is retightened after making test.

Pilot flame (VR4601/VR8601 only)



WARNING

It should be noted, that after a long time of stoppage (summer) it can take up to 60 s to come to an ignition of the pilot burner.

Outlet pressure adjustment (see fig. 1)

- Disconnect pressure feedback connection (if applicable)
- Energize both electric operators in order to have gas input to burner.
- Check gas input to the appliance using a clocking gas meter or alternatively a pressure gauge connected to the outlet pressure tap.
- Remove cap screw to expose pressure regulator adjustment screw.
- Slowly turn adjustment screw with a screw driver until the burner pressure required is recorded on the pressure gauge. Turn adjustment screw clockwise to increase or counter-clockwise to decrease gas pressure to the burner.
- For non-regulating mode (LP gas) turn adjustment screw clockwise until it stops.
- Replace pressure regulator cap screw.
- Connect pressure feedback connection (if applicable).

Check of slow opening (Softlite)

The Softlite pressure is factory set.

Check burner performance at this pressure observing burner ignition and flame characteristics. Burner should ignite promptly and without flash back to orifice and all ports should remain lit.

Cycle burner several times (wait 15 seconds between cycles to allow servo system to resume slow open action).

Repeat check of slow opening after allowing the appliance to cool down.

Checkout

Set appliance in operation after any adjustment and observe several complete cycles to ensure that all burner components function correctly.

Maintenance and service

Under normal circumstances no maintenance or service is required. Screws on the valve that have been sealed must never be removed.

Réglage de la pression de sortie (voir fig. 1)

- Déconnecter le tube de liaison entre le régulateur et la chambre de combustion (si cette connexion existe).
- Les opérateurs électriques doit être en fonction pour qu'il y ait alimentation en gaz au brûleur.
- Vérifier l'alimentation de l'appareil en ayant recours à un gazomètre ou éventuellement à un manomètre relié à la prise de pression de sortie.
- Retirer le bouchon de la vis de réglage du régulateur.
- Tourner doucement la vis de réglage au moyen d'un tournevis jusqu'à ce qu'on lise sur le manomètre la pression nécessaire pour le brûleur. Tourner la vis de réglage dans le sens des aiguilles d'une montre pour augmenter la pression et dans le sens contraire pour la diminuer.
- Pour les gaz propane et butane, il est utile d'annuler la régulation de pression, visser la vis de réglage dans le sens des aiguilles d'une montre jusqu'au bloquage.
- Replacer le bouchon sur la vis de réglage du régulateur.
- Connecter le tube de liaison entre le régulateur et la chambre de combustion (si cette connexion existe).

Vérification du ralenti d'allumage

La pression d'ouverture lente des modèles à ralenti d'allumage est réglée en usine. Contrôler le fonctionnement du brûleur à cette pression en observant les caractéristiques d'allumage et la flamme de celui-ci.

Le brûleur doit s'allumer rapidement et sans prise de feu à l'injecteur et tous les orifices doivent rester allumés. Répéter l'opération d'allumage plusieurs fois (attendre 15 s entre deux opérations pour permettre au servo régulateur de reprendre sa position initiale). Répéter après refroidissement de l'appareil.

Vérification finale

Avant de quitter l'installation laisser l'appareil en fonctionnement et observer durant un cycle complet pour s'assurer que les composants du système fonctionnent correctement.

Maintenance

En utilisation normale, aucune maintenance n'est pas requise.

Les vis scellées sur le bloc combiné ne doivent jamais être dévissées.

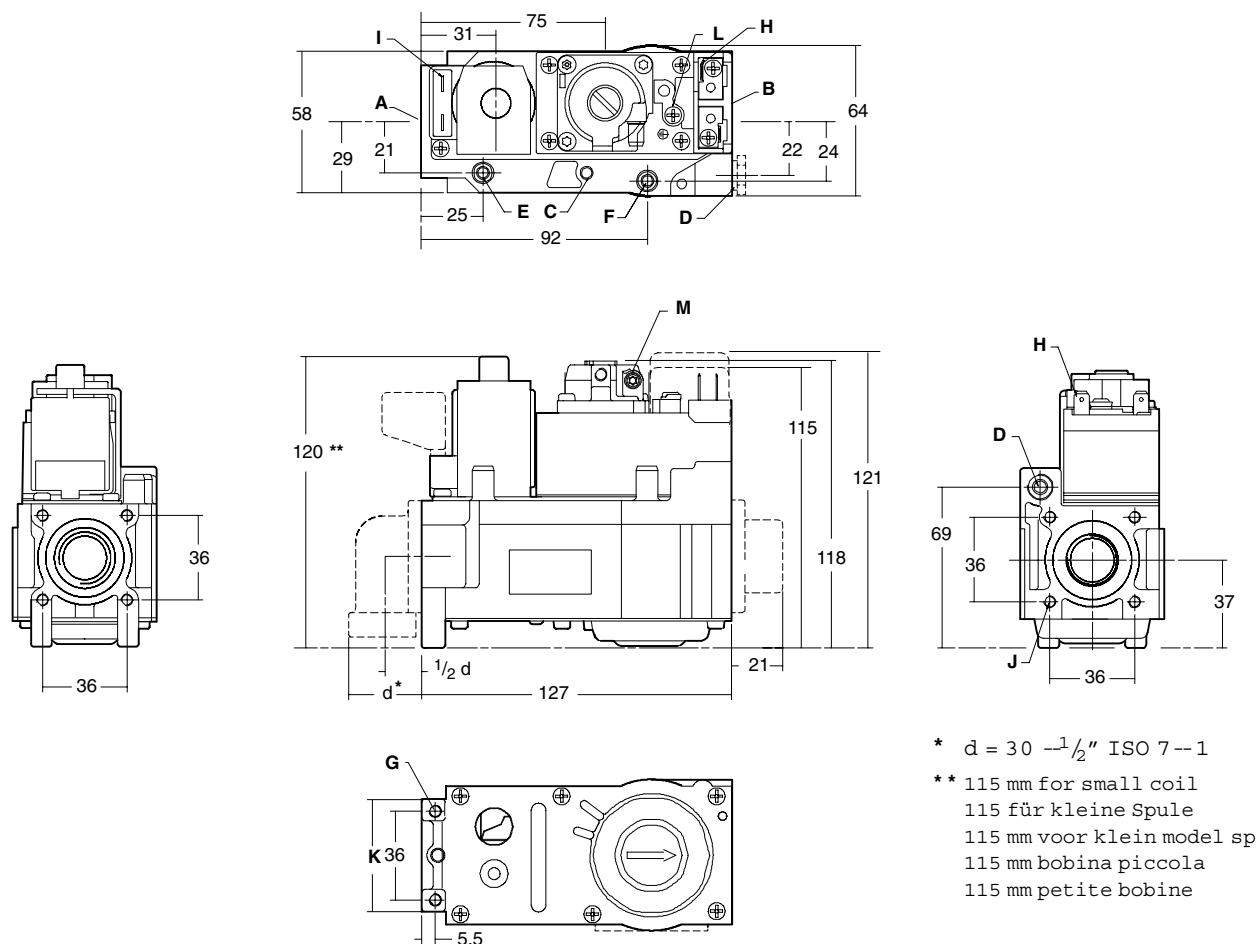


Fig. 1.
Abb. 1.

GB

- A** - Inlet
- B** - End outlet
- C** - M5 connection for switchable outlet (where applicable)
- D** - Pilot outlet (where applicable)
- E** - Inlet pressure tap
- F** - Outlet pressure tap
- G** - M5 mounting holes
- H** - 6.3 mm AMP terminals and screws for wiring
- I** - 6.3 mm AMP terminals
- K** - Surface to be clamped
- L** - Earth terminal/screw (line voltage models only)
- M** - M5 pressure feedback connection (where applicable)
- N** - Pressure regulator adjustment screw

D

- A** - Eingang
- B** - End Ausgang
- C** - M5 Anschlüsse für Umstelladapter der Langsamöffnung (falls anwendbar)
- D** - Zündgasaustritt (falls anwendbar)
- E** - Eingangsdruckmessnippel
- F** - Ausgangsdruckmessnippel
- G** - M5 Montagelöcher
- H** - 6.3 mm AMP Steck- und Schraubanschlüsse
- I** - 6.3 mm AMP Steckanschlüsse
- K** - Nur die mit K bezeichneten Stellen zum Einspannen oder Befestigen benutzen.
- L** - Erdungsschraube (nur bei 220/240V ~ 50 Hz oder 220V ~ 60 Hz Typen)
- M** - M5 Gewindeanschlussbohrung für Druck-rückmeldungs-Kompensation
- N** - Druckregler-Einstellschraube

NL

- A** - Inlaat
- B** - Eind uitlaat
- C** - M5 aansluiting voor omzetten Softlite druk (indien van toepassing)
- D** - Aansluiting aansteekgas (indien van toepassing)
- E** - Inlaatdruk meetnippel
- F** - Uitlaatdruk meetnippel
- G** - M5 montagegaten
- H** - 6.3 mm AMP vlakstekers en schroeven voor bedrading
- I** - 6.3 mm AMP vlakstekers
- K** - Alleen de met K gekenmerkte vlakken voor vastklemmen of bevestigen gebruiken.
- L** - Aardschroef (alleen bij 220/240V ~ 50 Hz of 220V ~ 60 Hz uitvoeringen)
- M** - M5 aansluiting voor drukcompensatie leiding verbrandingskamer
- N** - Drukinstelschroef

I

- A** - Entrata
- B** - Uscita di fine
- C** - Foro filettato M5 per adattatore di apertura lenta (se del caso)
- D** - Uscita verso la fiamme pilota (se del caso)
- E** - Presa per la misura della pressione d'ingresso
- F** - Presa per la misura della pressione d'uscita
- G** - Fori di montaggio
- H** - Connettori AMP di 6.3 mm a innesto e a vite
- I** - Connettori AMP di 6.3 mm
- K** - Per il fissaggio della valvola, utilizzare solamente i fori ciechi K
- L** - Connettore/vite di messa a terra soltanto tensione di linea)
- M** - Foro filettato M5 al fine di consentire la connessione della pressione di reazione
- N** - Vite di regolazione della pressione del flusso

F

- A** - Entrée
- B** - Sortie
- C** - Trou M5 pour raccordement pour l'interrupteur de changer de la pression d'ouverture lente (au cas qu'application)
- D** - Sortie veilleuse (au cas qu'application)
- E** - Prise de pression d'entrée
- F** - Prise de pression de sortie
- G** - Trous M5 de montage
- H** - Bornes AMP 6.3 mm et vis métrique pour câblage
- I** - Bornes AMP 6.3 mm
- K** - Utiliser seulement les emplacements quand le dispositif à besoin d'être immobilisé
- L** - Prise/vis de terre (haut tension seulement)
- M** - Trou M5 pour raccordement avec la chambre de combustion
- N** - Vis de réglage du régulateur de pression de sortie

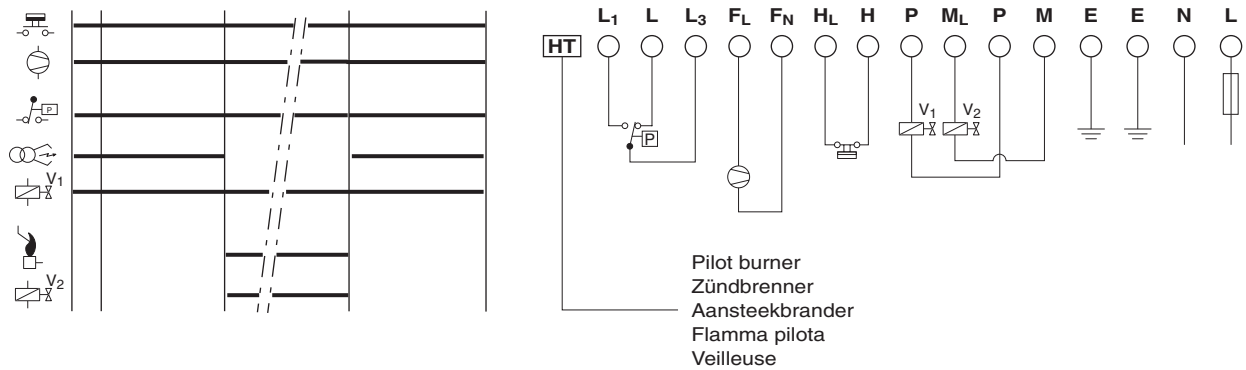


Fig. 2. S458
Abb. 2. S458

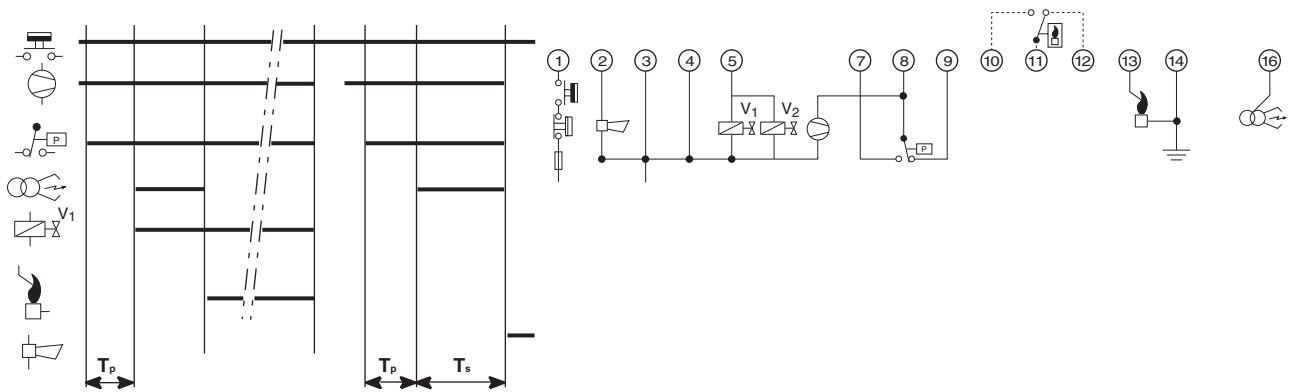


Fig. 3. S4560
Abb. 3. S4560

GB	Thermostat	Gas valve	Ignition	Flame rod	Fan	Limiter	reset switch	Flame indication relay	Alarm	Air proving switch
D	Temperatur regler	Gasventil	Zündung	Flammenmeldung	Gebälse	Begrenzer	Entriegelung	Flammenfühler	Alarm	Luftscharter
NL	Regelthermostaat	Gasklep	Ontsteking	Vlamwaarneming	Ventilator	Maximaalbeveiliging	Ontregeling	Vlam waarnemer	Alarm	Luchtdruk schakelaar
I	Termostato	Valvola gas	Accensione	Elettrodo	Ventilatore	Termostato limite	Interruttore di ripristino	Sensori fiamma	Allarme	Verificia contatto presostato aria
F	thermostat de régulation	Vanne gaz	Allumage	Electrode de la flamme	Ventilateur	Thermostat limiteur	Réarmement du interrupteur	Relais d'indication de flamme	Alarme	Contact de circulation d'air

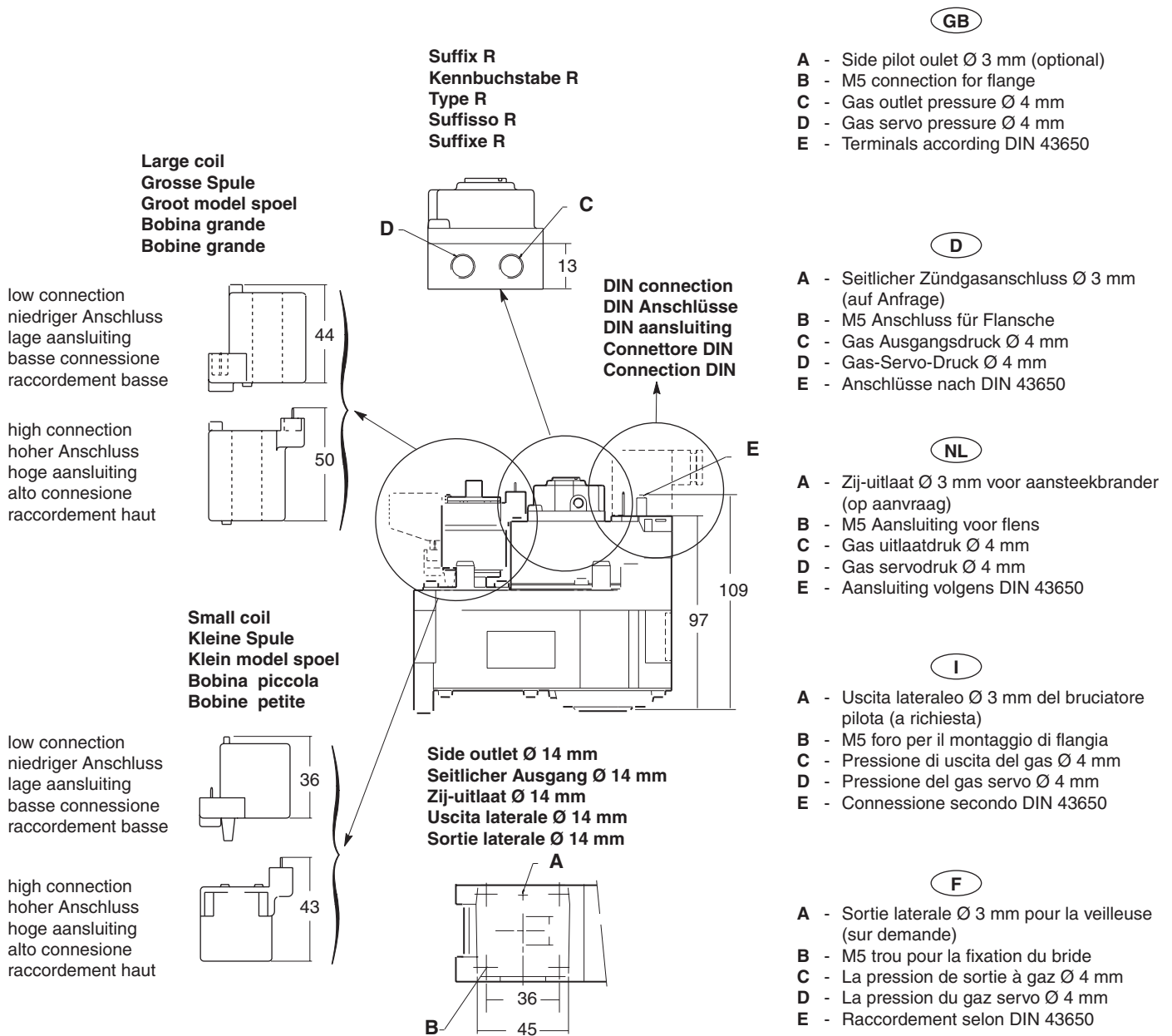


Fig. 4.
Abb. 4.

Honeywell

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MU1R-9082 0805R10-NE