TLX92R
TLX92.1
TLX512.1
TLX515.1
TLX520.1

Gas burners

MANUAL OF INSTALLATION - USE - MAINTENANCE

CIB UNIGAS

BURNERS - BRUCIATORI - BRULERS - BRENNER - QUEMADORES - ГОРЕЛКИ

M039551CD 0.0 11/2022

PERICOLI, AVVERTENZE E NOTE DI ATTENZIONE

Il manuale di installazione, uso e manutenzione costituisce parte integrante ed essenziale del prodotto e deve essere consegnato all'utilizzatore.

Le avvertenze contenute in questo capitolo sono dedicate sia all'utilizzatore che al personale che curera' l'installazione e la manutenzione del prodotto.

L'utilizzatore trovera' ulteriori informazioni sul funzionamento e sulle limitazioni d'uso nella 2ª parte di questo manuale che raccomandiamo di leggere con attenzione.

Conservare con cura il presente manuale per ogni ulteriore consultazione.

Quanto di seguito riportato:

- Presuppone la presa visione ed accettazione da parte del Cliente delle Condizioni Generali di Vendita dell'azienda. in vigore alla data di conferma d'ordine e consultabili in appendice ai Listini aggiornati.
- E' destinato in via esclusiva ad utenza specializzata, avvertita ed istruita. In grado operare in condizioni di sicurezza per le persone, per il dispositivo e per l'ambiente. Nel pieno rispetto delle prescrizioni oggetto delle pagine a seguire e delle norme di sicurezza e salute vigenti.

Le informazioni riguardanti assiemaggio/installazione, manutenzione, sostituzione e ripristino, sono destinate - e quindi eseguibili - sempre ed in via esclusiva da Personale specializzato e/o direttamente dall'Assistenza Tecnica Autorizzata.

IMPORTANTE :

La fornitura è stata realizzata alle migliori condizioni su base ordine ed indicazioni tecniche del Cliente concernenti lo stato dei luoghi e degli impianti di installazione; nonché sulla necessità di predisporre particolari certificazioni e/o adeguamenti aggiuntivi rispetto allo standard osservato e trasmesso in capo a ciascun Prodotto. In merito a ciò il Fabbricante declina qualsiasi responsabilità per contestazioni, malfunzionamenti, criticità, danni e/o altro di conseguente ad informazioni lacunose, imprecise e/o assenti; nonché al mancato rispetto delle prescrizioni tecniche e normative di installazione, primo avviamento, conduzione operativa e manutenzione.

Per un corretto rapporto col dispositivo è necessario garantire leggibilità e conservazione del manuale - anche per futuri riferimenti -. In caso di deterioramento o più semplicemente per ragioni di approfondimento tecnico ed operativo, rivolgersi direttamente al Costruttore. Testo, descrizioni, immagini, esemplificazioni e quant'altro di contenuto nel presente Documento, è di esclusiva proprietà del Fabbricante. E' vietata qualsiasi riproduzione.

ANALISI RISCHI

Il manuale di istruzione consegnato a corredo del bruciatore:

esso è parte integrante ed essenziale del prodotto e non va da esso separato; deve essere quindi conservato con cura per ogni necessaria consultazione e deve accompagnare il bruciatore anche in caso di cessione ad un altro proprietario o utente, oppure in caso di trasferimento su un altro impianto. In caso di danneggiamento o smarrimento deve essere richiesto un altro esemplare al Servizio Tecnico di Assistenza di Zona;

Consegna dell'impianto e del manuale di istruzione

Il fornitore dell'impianto è tenuto ad informare accuratamente l'utente circa:.

– l'uso dell'impianto;

– gli eventuali ulteriori collaudi che dovessero essere necessari prima dell'attivazione dell'impianto,

– la manutenzione e la necessità di controllare l'impianto almeno una volta all'anno da un incaricato della Ditta Costruttrice o da un altro tecnico specializzato.

Per garantire un controllo periodico, il costruttore raccomanda la stipulazione di un Contratto di Manutenzione.

RESPONSABILITÀ E GARANZIA

In particolare i diritti alla garanzia ed alla responsabilità decadono, in caso di danni a persone e/o cose, qualora i danni stessi siano riconducibili ad una o più delle seguenti cause:

- installazione, messa in funzione, uso e manutenzione del bruciatore non corretti;
- utilizzo improprio, erroneo ed irragionevole del bruciatore;
- intervento di personale non abilitato;
- esecuzione di modifiche non autorizzate all'apparecchio;
- utilizzo del bruciatore con dispositivi di sicurezza difettosi, applicati in maniera scorretta e/o non funzionanti;
- installazione di componenti supplementari non collaudati unitamente al bruciatore;
- alimentazione del bruciatore con combustibili non adatti;
- difetti nell'impianto di alimentazione del combustibile;
- utilizzo del bruciatore anche a seguito del verificarsi di un errore e/o un'anomalia;
- riparazioni e/o revisioni eseguite in maniera scorretta;
- modifica della camera di combustione mediante l'introduzione di inserti che impediscano il regolare sviluppo della fiamma stabilito costruttivamente;
- insufficiente ed inappropriata sorveglianza e cura dei componenti del bruciatore maggiormente soggetti ad usura;
- utilizzo di componenti non originali, siano essi ricambi, kits,
- accessori ed optionals;
- cause di forza maggiore.

Il costruttore, inoltre, declina ogni e qualsiasi responsabilità per la mancata osservanza di quanto riportato nel presente manuale.



ATTENZIONE! La mancata osservanza a quanto descritto in questo manuale, la negligenza operativa, una errata installazione e l'esecuzione di modifiche non autorizzate, sono causa di annullamento, da parte del costruttore, della garanzia che essa dà al bruciatore.

Formazione del personale

L'utente è la persona, o l'ente o la società, che ha acquistato la macchina e che intende usarla per gli usi concepiti allo scopo. Sua è la responsabilità della macchina e dell'addestramento di quanti vi operano intorno.

L'utente:

- si impegna ad affidare la macchina esclusivamente a personale qualificato ed addestrato allo scopo;
- è tenuto a prendere tutte le misure necessarie per evitare che persone non autorizzate abbiano accesso alla macchina;
- si impegna ad informare il proprio personale in modo adeguato sull'applicazione e osservanza delle prescrizioni di sicurezza. A tal fine egli si impegna affinchè chiunque per la propria mansione conosca le istruzioni per l'uso e le prescrizioni di sicurezza;
- deve informare la Ditta Costruttrice nel caso in cui riscontrasse difetti o malfunzionamenti dei sistemi antinfortunistici, nonchè ogni situazione di presunto pericolo.
- Il personale deve usare sempre i mezzi di protezione individuale previsti dalla legislazione e seguire quanto riportato nel presente manuale.
- Il personale deve attenersi a tutte le indicazioni di pericolo e cautela segnalate sulla macchina.
- Il personale non deve eseguire di propria iniziativa operazioni o interventi che non siano di sua competenza.
- Il personale ha l'obbligo di segnalare al proprio superiore ogni problema o situazione pericolosa che si dovesse creare.
- Il montaggio di pezzi di altre marche o eventuali modifiche possono variare le caratteristiche della macchina e quindi pregiudicarne la sicurezza operativa. La Ditta Costruttrice pertanto declina ogni e qualsiasi responsabilità per tutti i danni che dovessero insorgere a causa dell'utilizzo di pezzi non originali.

AVVERTENZE GENERALI

- Per personale professionalmente qualificato si intende quello avente competenza tecnica nel settore di applicazione dell'apparecchio (civile o industriale) e in particolare, i centri assistenza autorizzati dal costruttore.
- Un'errata installazione può causare danni a persone, animali o cose, per i quali il costruttore non è responsabile.
- Dopo aver tolto ogni imballaggio assicurarsi dell'integrità del contenuto.

In caso di dubbio non utilizzare l'apparecchio e rivolgersi al fornitore.

Gli elementi dell'imballaggio (gabbia di legno, chiodi, graffe, sacchetti di plastica, polistirolo espanso, ecc.) non devono essere lasciati alla portata dei bambini in quanto potenziali fonti di pericolo.

- Prima di effettuare qualsiasi operazione di pulizia o di manutenzione, disinserire l'apparecchio dalla rete di alimentazione, agendo sull'interruttore dell'impianto e/o attraverso gli appositi organi di intercettazione

- Non ostruire le griglie di aspirazione o di dissipazione
- In caso di guasto e/o di cattivo funzionamento dell'apparecchio, disattivarlo, astenendosi da qualsiasi tentativo di riparazione o di intervento diretto.

Rivolgersi esclusivamente a personale professionalmente qualificato.

L'eventuale riparazione dei prodotti dovrà essere effettuata solamente da un centro di assistenza autorizzato dalla casa costruttrice utilizzando esclusivamente ricambi e accessori originali.

Il mancato rispetto di quanto sopra può compromettere la sicurezza dell'apparecchio.

Per garantire l'efficienza dell'apparecchio e per il suo corretto funzionamento è indispensabile fare effettuare da personale professionalmente qualificato la manutenzione periodica attenendosi alle indicazioni del costruttore.

- Allorchè si decida di non utilizzare più l'apparecchio, si dovranno rendere innocue quelle parti suscettibili di causare potenziali fonti di pericolo;
- Se l'apparecchio dovesse essere venduto o trasferito ad un altro proprietario se si dovesse traslocare e lasciare l'apparecchio, assicurarsi sempre che il presente libretto accompagni l'apparecchio, in modo che possa essere consultato dal nuovo proprietario e/o dall'installatore
- Questo apparecchio dovrà essere destinato all'uso per il quale è stato espressamente previsto. Ogni altro uso è da considerarsi improprio e quindi pericoloso.

E' esclusa qualsiasi responsabilità contrattuale ed extra contrattuale del costruttore per i danni causati da errori nell'installazione e nell'uso, e comunque da inosservanza delle istruzioni date dal costruttore stesso.

Il verificarsi di una delle seguenti circostanze può causare danni anche gravi a persone, animali e cose, esplosioni, incombusti tossici (ad esempio ossido di carbonio CO) e ustioni:

- inosservanza di una delle AVVERTENZE riportate in questo capitolo
- inosservanza della buona norma applicabile
- errata movimentazione, installazione, regolazione, manutenzione
- uso impriprio del bruciatore e delle sue parti o optional di fornitura

AVVERTENZE PARTICOLARI PER BRUCIATORI

- Il bruciatore deve essere installato in locale adatto con aperture minime di ventilazione secondo quanto prescritto dalle norme vigenti e comunque sufficienti ad ottenere una perfetta combustione.
- Devono essere utilizzati solo bruciatori costruiti secondo le norme vigenti.
- Questo bruciatore dovrà essere destinato solo all'uso per il quale è stato espressamente previsto.
- Prima di collegare il bruciatore accertarsi che i dati di targa siano corrispondenti a quelli della rete di alimentazione (elettrica, gas, gasolio o altro combustibile).
- Non toccare le parti calde del bruciatore. Queste, normalmente situate in vicinanza della fiamma e dell'eventuale sistema di preriscaldamento del combustibile, diventano calde durante il funzionamento e permangono tali anche dopo l'arresto del bruciatore.

Allorchè si decida di non utilizzare in via definitiva il bruciatore, si dovranno far effettuare da personale professionalmente qualificato le seguenti operazioni:

a disinserire l'alimentazione elettrica staccando il cavo di alimentazione dall'interruttore generale;

b chiudere l'alimentazione del combustibile attraverso la valvola manuale di intercettazione asportando i volantini di comando dalla loro sede.

Avvertenze particolari

- Accertarsi che chi ha eseguito l'installazione del bruciatore lo abbia fissato saldamente al generatore di calore in modo che la fiamma si generi all'interno della camera di combustione del generatore stesso.
- prima di avviare il bruciatore, e almeno una volta all'anno, far effettuare da personale professionalmente qualificato le seguenti operazioni:
  - a tarare la portata di combustibile del bruciatore secondo la potenza richiesta dal generatore di calore;
  - b regolare la portata d'aria comburente per ottenere un valore di rendimento di combustione almeno pari al minimo imposto dalle norme vigenti;
  - c eseguire il controllo della combustione onde evitare la formazione di incombusti nocivi o inquinanti oltre i limiti consen-titi dalle norme vigenti;
  - d verificare la funzionalità dei dispositivi di regolazione e di sicurezza;
  - e verificare la corretta funzionalità del condotto di evacuazione dei prodotti della combustione;
  - f controllare al termine delle regolazioni che tutti i sistemi di bloccaggio meccanico dei dispositivi di regolazione siano ben serrati;
  - g accertarsi che nel locale caldaia siano presenti anche le istruzioni relative all'uso e manutenzione del bruciatore.
- In caso di arresto di blocco, sbloccare l'apparecchiatura premendo l'apposito pulsante di RESET. Nell'eventualità di un nuovo arresto di blocco, interpellare l'Assistenza Tecnica, **senza effettuare ulteriori tentativi**.
- La conduzione e la manutenzione devono essere effettuate esclusivamente da personale professionalmente qualificato, in ottemperanza alle disposizioni vigenti.

AVVERTENZE GENERALI IN FUNZIONE DEL TIPO Di ALIMENTAZIONE

ALIMENTAZIONE ELETTRICA

- La sicurezza elettrica dell'apparecchio è raggiunta soltanto quando lo stesso è correttamente collegato a un'efficace impianto di messa a terra, eseguito come previsto dalle vigenti norme di sicurezza.
- E' necessario verificare questo fondamentale requisito di sicurezza. In caso di dubbio, richiedere un controllo accurato dell'impianto elettrico da parte di personale professionalmente qualificato, poiché il costruttore non è responsabile per eventuali danni causati dalla mancanza di messa a terra dell'impianto.
- Far verificare da personale professionalmente qualificato che l'impianto elettrico sia adeguato alla potenza massima assorbita dall'apparecchio, indicata in targa, accertando in particolare che la sezione dei cavi dell'impianto sia idonea alla potenza assorbita dall'apparecchio.
- Per l'alimentazione generale dell'apparecchio dalla rete elettrica, non è consentito l'uso di adattatori, prese multiple e/o prolunghe.
- Per l'allacciamento alla rete occorre prevedere un interruttore onnipolare come previsto dalle normative di sicurezza vigenti.
- L'uso di un qualsiasi componente che utilizza energia elettrica comporta l'osservanza di alcune regole fondamentali quali:

  - non toccare l'apparecchio con parti del corpo bagnate o umide e/o a piedi nudi
  - non tirare i cavi elettrici
  - non lasciare esposto l'apparecchio ad agenti atmosferici (pioggia, sole, ecc.) a meno che non sia espressamente previsto
  - non permettere che l'appparecchio sia usato da bambini o da persone inesperte.
- Il cavo di alimentazione dell'apparecchio non deve essere sostituito dall'utente. In caso di danneggiamento del cavo, spegnere l'apparecchio, e, per la sua sostituzione, rivolgersi esclusivamente a personale professionalmente qualificato.

Allorchè si decida di non utilizzare l'apparecchio per un certo periodo, è opportuno spegnere l'interruttore elettrico di alimentazione a tutti i componenti dell'impianto che utilizzano energia elettrica (pompe, bruciatore, ecc.).

ALIMENTAZIONE CON GAS, GASOLIO, O ALTRI COMBUSTIBILI

Avvertenze generali

- L'installazione del bruciatore deve essere eseguita da personale professionalmente qualificato e in conformità alle norme e disposizioni vigenti, poiché un'errata installazione può causare danni a persone, animali o cose, nei confronti dei quali il costruttore non può essere considerato responsabile.
- Prima dell'installazione, si consiglia di effettuare una accurata pulizia interna di tutte le tubazioni dell'impianto di adduzione del combustibile onde rimuovere eventuali residui che potrebbero compromettere il buon funzionamento del bruciatore.
- Per la prima messa in funzione del bruciatore, far effettuare da personale professionalmente qualificato le seguenti verifiche:
  - a il controllo della tenuta interna ed esterna dell'impianto di adduzione del combustibile;
  - b la regolazione della portata del combustibile secondo la potenza richiesta dal bruciatore;
  - c che il bruciatore sia alimentato dal tipo di combustibile per il quale è predisposto;
  - d che la pressione di alimentazione del combustibile sia compresa nei valori riportati in targhetta;

e che l'impianto di alimentazione del combustibile sia dimensionato per la portata necessaria al bruciatore e che sia dotato di tutti i dispositivi di sicurezza e controllo prescritti dalle norme vigenti.

- Allorchè si decida di non utilizzare il bruciatore per un certo periodo, chiudere il rubinetto o i rubinetti di alimentazione del combustibile.

Avvertenze particolari per l'uso del gas

Far verificare da personale professionalmente qualificato:

a che la linea di adduzione e la rampa gas siano conformi alle norme e prescrizioni vigenti.

b che tutte le connessioni gas siano a tenuta.

c che le aperture di aerazione del locale caldaia siano dimensionate in modo da garantire l'afflusso di aria stabilito dalle normative vigenti e comunque sufficienti ad ottenere una perfetta combustione.

- Non utilizzare i tubi del gas come messa a terra di apparecchi elettrici.
- Non lasciare il bruciatore inutilmente inserito quando lo stesso non è utilizzato e chiudere sempre il rubinetto del gas.
- In caso di assenza prolungata dell'utente, chiudere il rubinetto principale di adduzione del gas al bruciatore.

TARGA DATI DEL BRUCIATORE

Per le seguenti informazioni fare sempre riferimento alla targa dati del bruciatore:

- Tipo e modello della macchina (da segnalare in ogni comunicazione col fornitore macchina).
- Numero matricola bruciatore (da segnalare obbligatoriamente in ogni comunicazione col fornitore).
- Data fabbricazione (mese e anno)
- Indicazione su tipo gas e pressione in rete

Tipo	--
Modello	--
Anno	--
Mat.	--
Port.	--
Port. Olio	--
Comb.	--
Cat	--
Press	--
Visc	--
Tens.	--
Pot.Elet.	--
P.Vent.	--
Prot.	--
Dest.	--
PIN	--

Avvertendo odore di gas

a non azionare interruttori elettrici, il telefono o qualsiasi altro oggetto che possa provocare scintille

b aprire immediatamente porte e finestre per creare una corrente d'aria che purifichi il locale

c chiudere i rubinetti del gas

d chiedere l'intervento di personale professionalmente qualificato

- Non ostruire le aperture di aerazione del locale dove è installato un apparecchio a gas, per evitare situazioni pericolose quali la formazione di miscele tossiche ed esplosive.

Utilizzo manometri olio

In genere, i manometri sono equipaggiati con una valvola manuale. Aprire la valvola solo per effettuare la lettura e chiuderla immediatamente dopo.

Sicurezza e prevenzione

- E' vietato aprire o manomettere i componenti del bruciatore, ad esclusione delle sole parti previste nella manutenzione.
- Si possono sostituire esclusivamente le parti previste dal costruttore.

SIMBOLI UTILIZZATI

ATTENZIONE	Questo simbolo contraddistingue avvertenze, la cui inosservanza può produrre danni irreparabili all'apparecchio o danni all'ambiente.
PERICOLO!	Questo simbolo contraddistingue avvertenze,la cui inosservanza può avere come conseguenza gravi danni per la salute fino a ferimenti mortali.
PERICOLO!	Questo simbolo contraddistingue avvertenze, la cui inosservanza può comportare scosse elettriche con conseguenze mortali

SICUREZZA DEL BRUCIATORE

I bruciatori – e le configurazioni di seguito descritte – sono conformi alle norme vigenti in materia di sicurezza, salute ed ambiente. Per qualsiasi approfondimento, consultare le dichiarazioni di conformità che sono parte integrante di questo Manuale.

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PERICOLO! Una rotazione errata del motore può provocare gravi danni a persone e cose.

- .E' vietato toccare con mani o qualsiasi altra parte del corpo elementi meccanici in movimento. Pericolo di infortunio.
- Evitare il contatto diretto con le parti contenenti il combustibile (Esempio: serbatoio e tubi). Pericolo di scottature.
- E' vietato utilizzare il bruciatore in situazioni differenti da quelle previste nella targa dati.
- E' vietato utilizzare il bruciatore con combustibili diversi da quelli specificati.
- E' severamente vietato utilizzare il bruciatore in ambienti potenzialmente esplosivi.
- E' vietato rimuovere o escludere elementi di sicurezza della macchina.
- E' vietato rimuovere i dispositivi di protezione o aprire il bruciatore o qualsiasi suo componente mentre sta funzionando.
- E' vietato scollegare parti del bruciatore o suoi componenti durante il funzionamento del bruciatore stesso.

E' vietato l'intervento su leveraggi da parte di personale non competente/istruito.

Dopo qualsiasi intervento, è importante ripristinare i sistemi di protezione prima di riaccendere la macchina .

- E' obbligatorio mantenere la piena efficienza di tutti i dispositivi di sicurezza.
- Il personale autorizzato ad intervenire sulla macchina deve sempre essere munito di protezioni.

ATTENZIONE: durante il ciclo di funzionamento, le parti di bruciatore in prossimità del generatore (flangia di accoppiamento) sono soggette a surriscaldamento. Ove necessario, prevenire rischi da contatto dotandosi di opportuni D.P.I..

DIRETTIVE E NORME APPLICATE

Bruciatori di gas

Direttive europee:

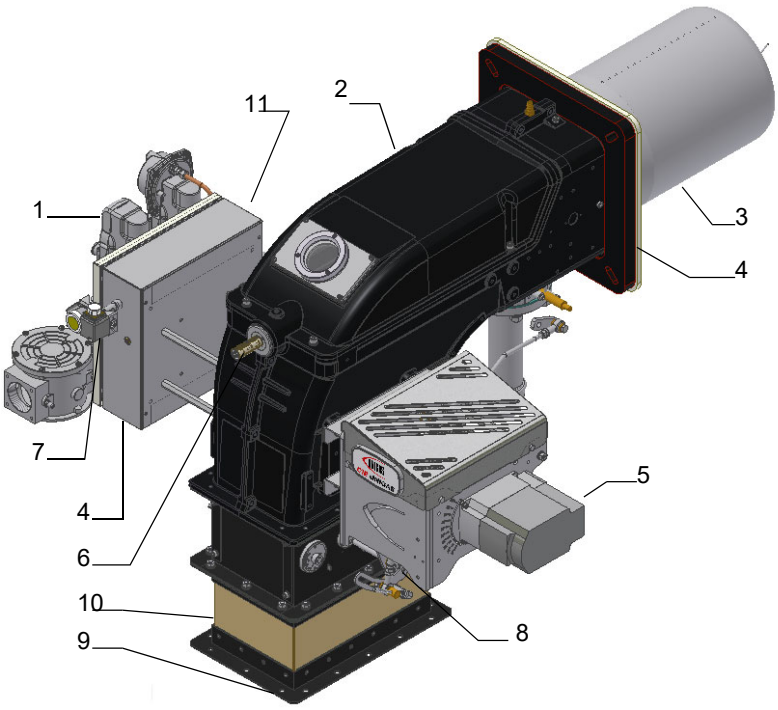
2016/426/UE (Regolamento Apparecchi a Gas)
2014/35/UE (Direttiva Bassa Tensione)
2014/30/UE (Direttiva Compatibilità Elettromagnetica)
2006/42/CE (Direttiva Macchine)

Norme armonizzate:

UNI EN 676 (Bruciatori automatici di combustibili gassosi ad aria soffiata)
EN 55014-1 (Compatibilità-Requisiti elettromagnetici degli elettrodomestici, degli attrezzi elettrici e di simili apparecchi)
EN 60204-1:2006 (Sicurezza degli equipaggiamenti elettrici delle macchine)
CEI EN 60335-1 (Sicurezza degli apparecchi elettrici d' uso domestico e similare)
CEI EN 60335-2-102 Sicurezza degli apparecchi elettrici d'uso domestico e similare - Parte 2: Norme particolari per apparecchi aventi bruciatori a gas, gasolio e combustibile solido provvisti di connessioni elettriche
UNI EN ISO 12100:2010 (Sicurezza del macchinario - Principi generali di progettazione - Valutazione del rischio e riduzione del rischio)

PART I: SPECIFICATIONS

BURNERS FEATURES



1 Gas train
2 Cover
3 Blast tube + Combustion head
4 Flange
5 Actuator
6 Combustion head adjusting ring nut
7 Air pressure switch
8 Sector variable
9 Air inlet flange
10 Bellows
11 Burner junction box

Gas operation: From the supply line the gas fuel passes through the gas train (filter, safety valves, gas pressure regulator and butterfly valve). The pressure regulator sets the gas pressure within the combustion head utilization limits. Air is supplied by a fan, which may be onboard or separated depending on burner configuration, and is channeled through an air damper.

The air damper and the gas butterfly valve are actuated by servomotors according to load curves, in order to achieve the correct proportion between fuel and air flows, and to optimize flue gas parameters.

The adjustable combustion head can improve the burner performance by controlling the flame geometry and combustion efficiency.

Fuel and air are routed through separated channels inside the combustion head, then mixed to ignite the flame inside the combustion chamber. The ignition spark is provided by electrodes and a high voltage transformer (a pilot flame may also be employed, depending on burner configuration).

Pre-ventilation of the combustion chamber is usually implemented according to gas directives.
The control panel, onboard or separated, allows the operator to monitor each operating phase.

Gas categories and countries of application

GAS CATEGORY	COUNTRY
I_{2H}	AT, ES, GR, SE, FI, IE, HU, IS, NO, CZ, DK, GB, IT, PT, CY, EE, LV, SI, MT, SK, BG, LT, RO, TR, CH
I_{2E}	LU, PL
$I_{2E(R)B}$	BE
I_{2EK}	NL
I_{2ELL}	DE
I_{2Er}	FR

Fuel

DANGER! The burner must be used only with the fuel specified in the burner data plate.

Type	--
Model	--
Year	--
S.Number	--
Output	--
Oil Flow	--
Fuel	--
Category	--
Gas Pressure	--
Viscosity	--
El.Supply	--
El.Consump.	--

Burner model identification

Burners are identified by burner type and model. Burner model identification is described as follows.

Type	**TLX92R**	Model	**M-.**	**PR.**	**S.**	***.**	**E.**	**1.**	**50.**
	(1)		**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**

1	BURNER TYPE	**TLX92R, TLX92.1, TLX512.1, TLX515.1, TLX520.1**
2	FUEL	M - Natural gas
3	OPERATION (Available versions)	PR - Progressive
4	BLAST TUBE	S - Standard L - Extended
5	DESTINATION COUNTRY	* - see data plate
6	BURNER VERSION	E- Junction box
7	EQUIPMENT	1 = 2 gas valves + gas proving system 8 = 2 gas valves + gas proving system + maximum gas pressure switch
8	GAS CONNECTION	50 = Rp2, 65 = DN65, 80 = DN80, 100 = DN100

Technical Specifications

BURNER TYPE		**TLX92R M-...**	**TLX92.1 M-...**	**TLX512.1 M-...**	**TLX515.1 M-...**	**TLX520.1 M-...**
Output	min. - max. kW	350 - 2550	670 - 3100	1280 - 4500	1.065 - 5200	1.600 - 6020
Fuel		M - Natural gas				
Category		(see next paragraph)				
Gas rate- Natural gas	min.- max. (Stm^3/h)	37 - 270	71 - 328	135 - 476	113 - 550	169 - 637
Gas pressure	mbar	(see Note 2)				
Power supply		400V 3N ~ 50Hz				
Total power consumption	kW	0,5				
Protection		IP40				
Operation		Progressive - Fully modulating				
Operating temperature	°C	-10 ÷ +50				
Storage Temperature	°C	-20 ÷ +60				
Working service (*)		Intermitent				

Note1:	**All gas flow rates are referred to Stm^3 / h (1.013 mbar absolute pressure, 15 °C temperature) and are valid for G20 gas (net calorific value H_i = 34,02 MJ / Stm^3); for L.P.G. (net calorific value H_i = 93,5 MJ / Stm^3)**
Note2:	**Maximum gas pressure = 360 mbar (with Dungs MBDLE)** **= 500 mbar (with Siemens VGD or Dungs MultiBloc MBE)** **Minimum gas pressure = see gas curves.**
Note3:	**Burners are suitable only for indoor operation with a maximum relative humidity of 80 %**
Note4:	**with electrode**

Fuel

The burner technical specifications, described in this manual, refer to natural gas (calorific net value Hi = 9,45 kWh/Stm^3, density ρ = 0,717 Kg/Stm^3). For different fuel such as LPG, town gas and biogas, multiply the values of flow and pressure by th corrective factors shown in the table below.

Fuel	**Hi** (KWh/Stm^3)	**ρ** (kg/Stm^3)	f_Q	f_p
LPG	26,79	2,151	0,353	0,4
Town gas	4,88	0,6023	1,936	3,3
Biogas	6,395	1,1472	1,478	3,5

For example, to obtain the flow and pressure values for the biogas:

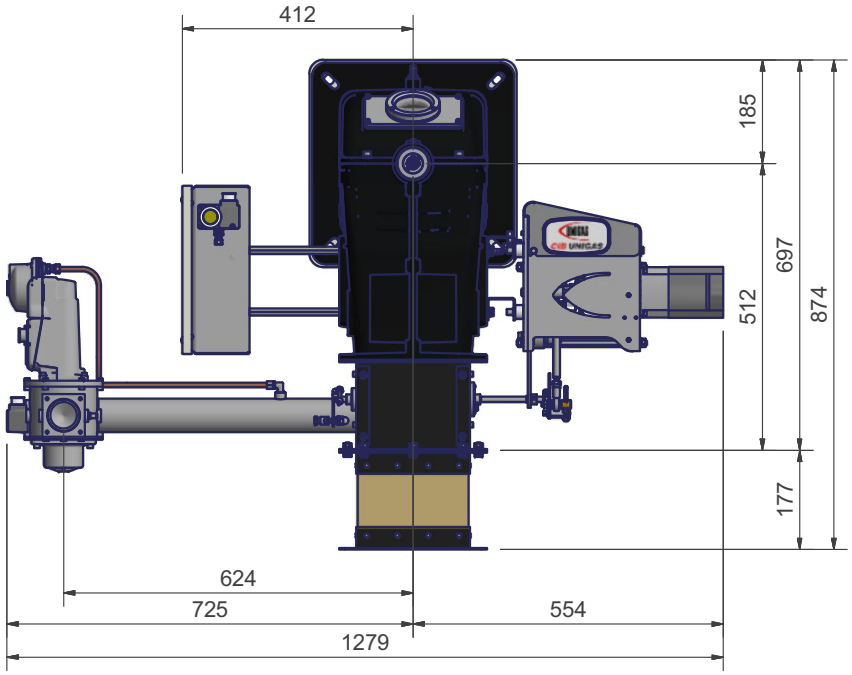
$$Q_{biogas} = Q_{naturalGas} \cdot 1,478$$

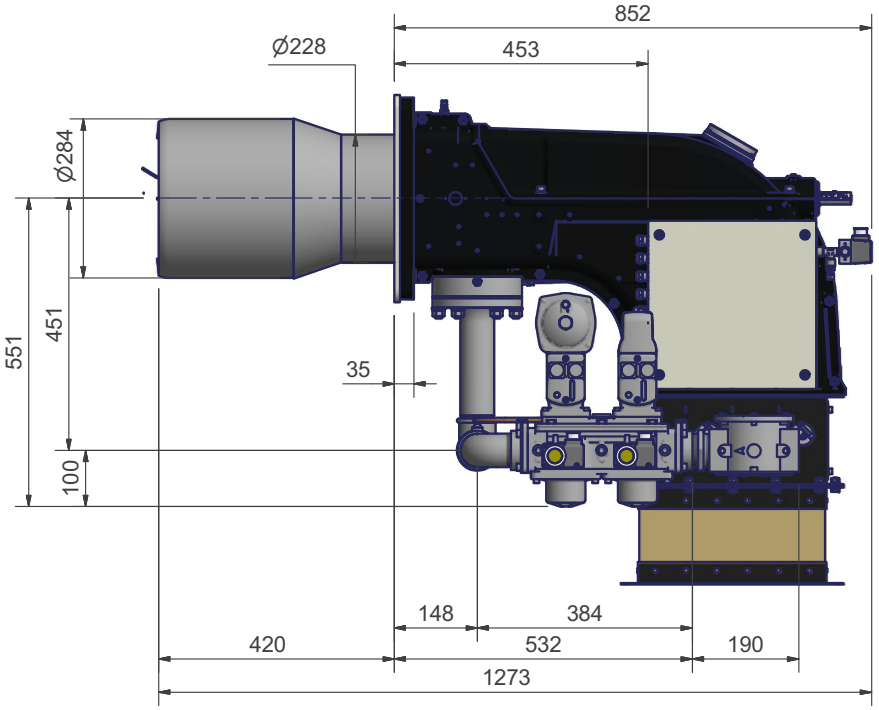
$$p_{biogas} = p_{naturalGas} \cdot 3,5$$

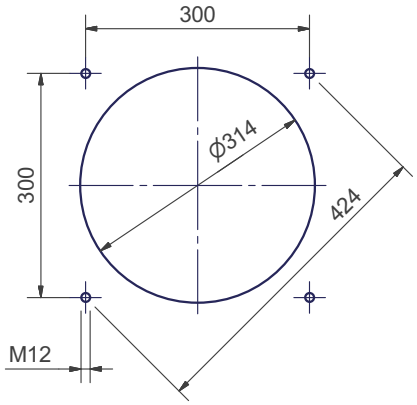
ATTENTION! The combustion head type and the settings depend on the fuel. The burner must be used only for its intended purpose specified in the burner data plate .

ATTENTION! The corrective factors in the above table depend on the gas composition, so on the calorifc value and the density of the gas. The above value can be taken only as reference.

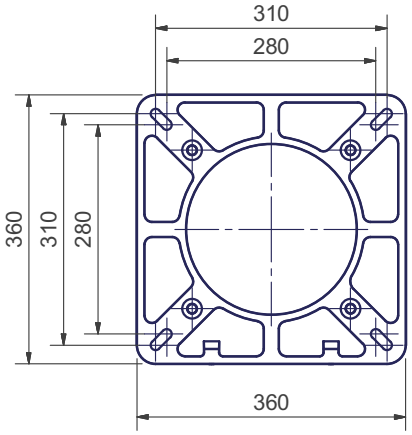
Overall dimensions (mm) TLX92.1



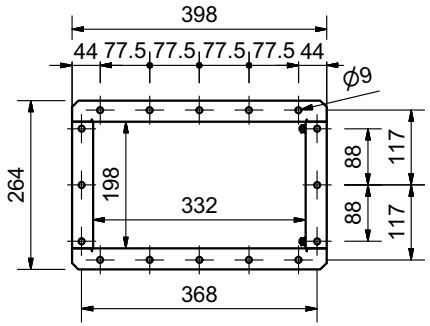




BOILER RECOMMENDED DRILLING TEMPLATE

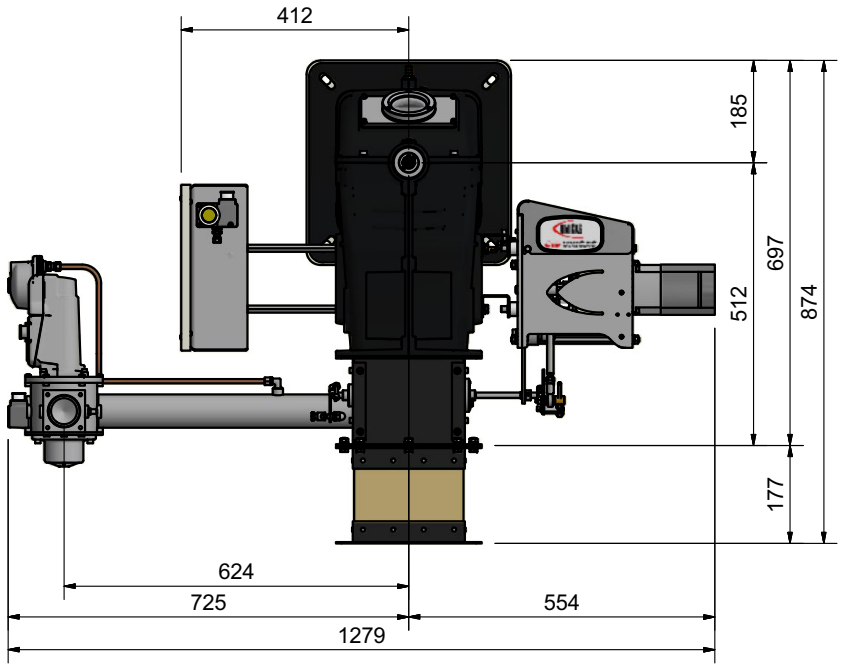


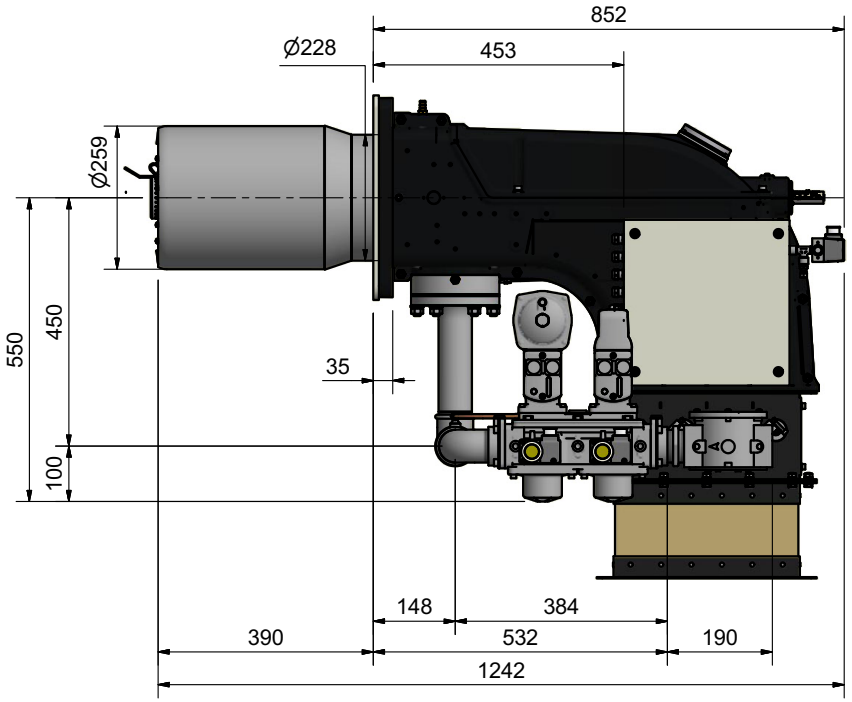
BURNER FLANGE

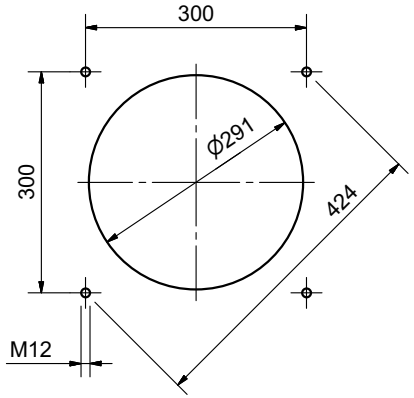


AIR INLET FLANGEI

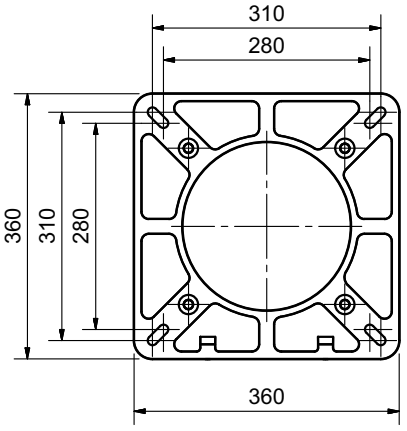
Overall dimensions (mm) **TLX92R** *(1.50)*



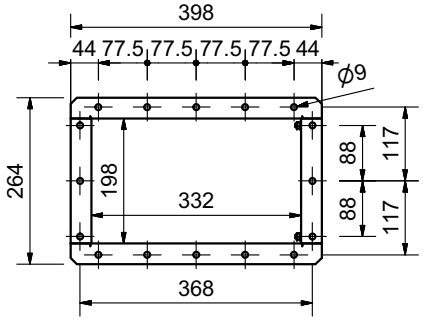




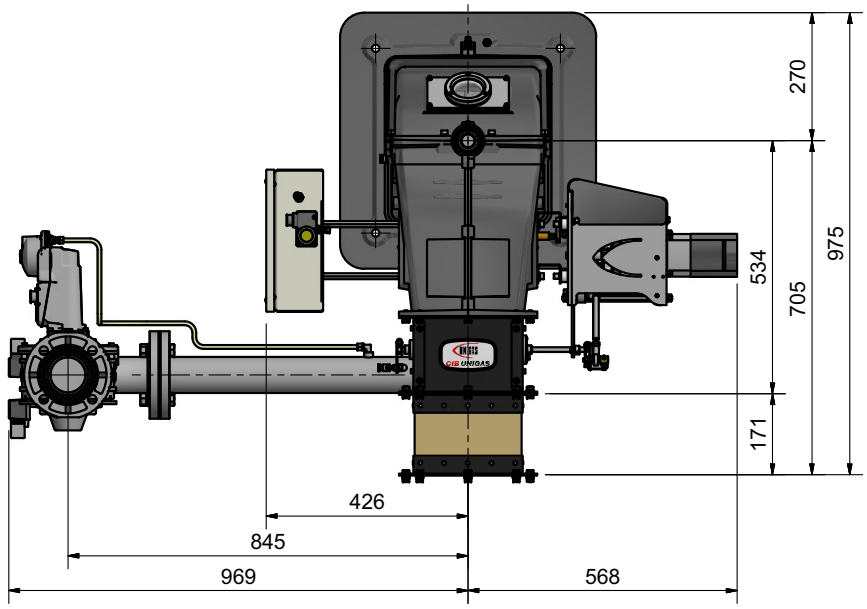
BOILER RECOMMENDED DRILLING TEMPLATE

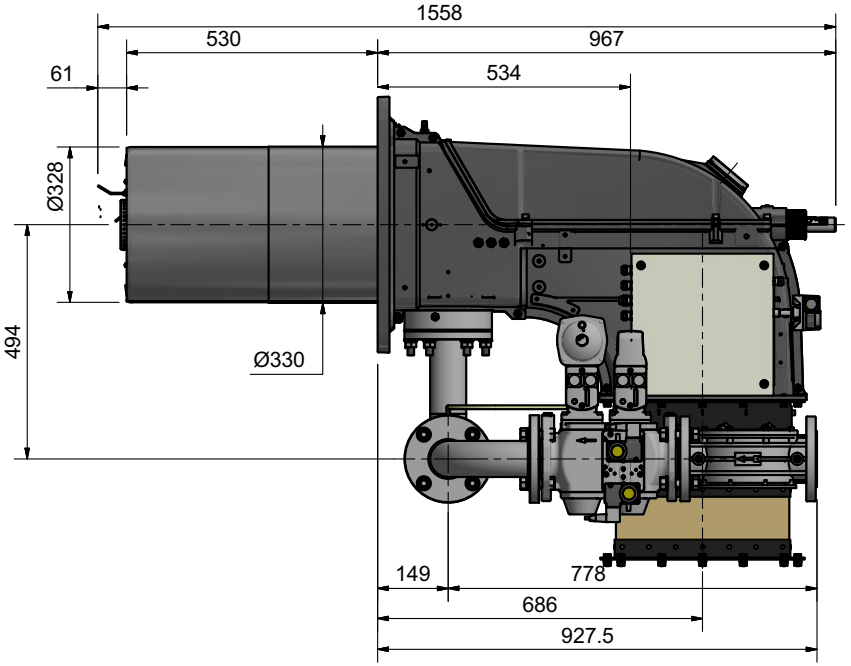


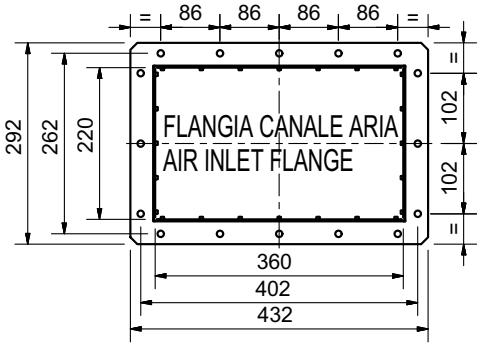
BURNER FLANGE



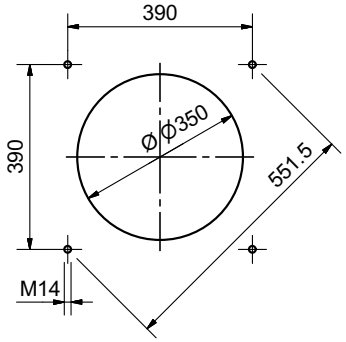
AIR INLET FLANGEI



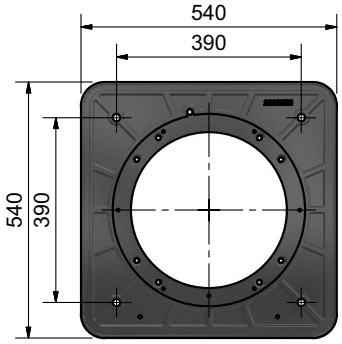




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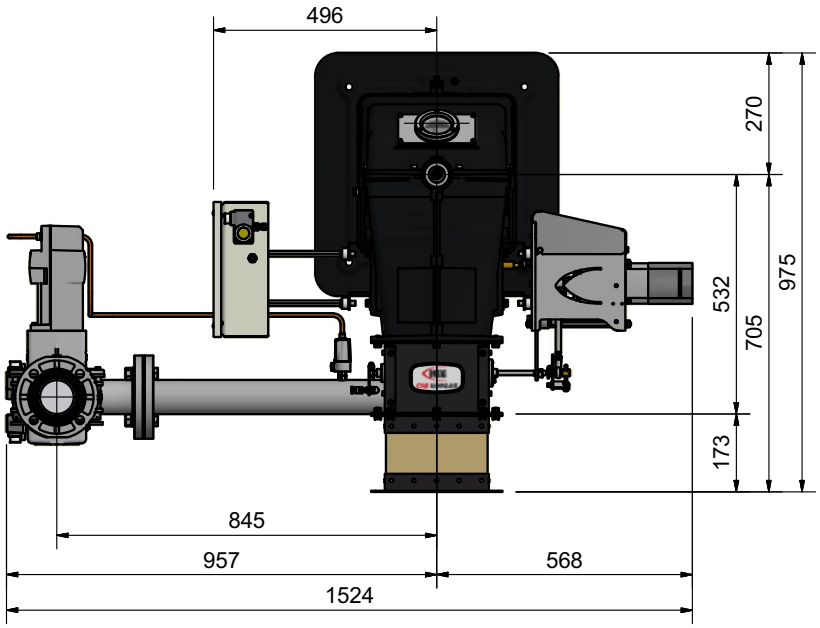


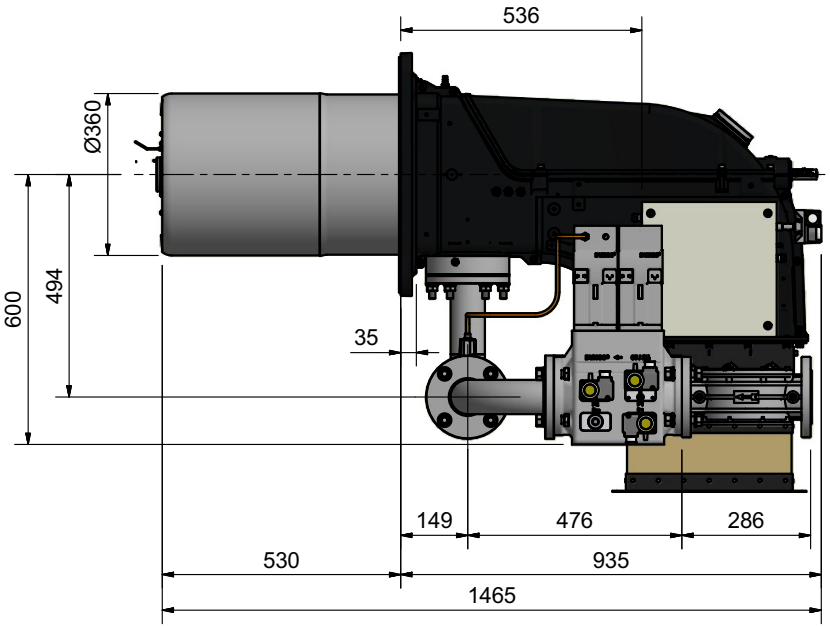
BOILER RECOMMENDED DRILLING TEMPLATE

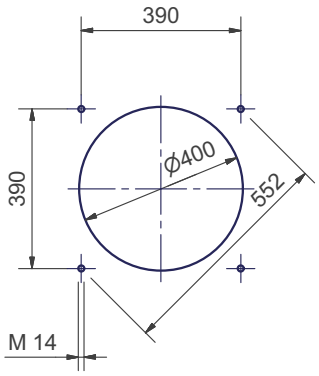


BURNER FLANGE

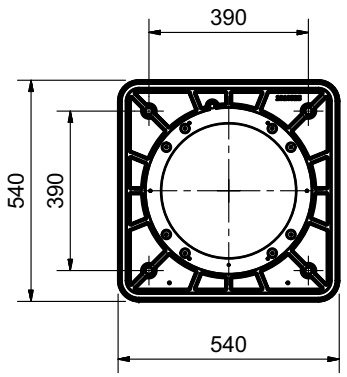
Overall dimensions (mm) **TLX515.1** *(1.65)*



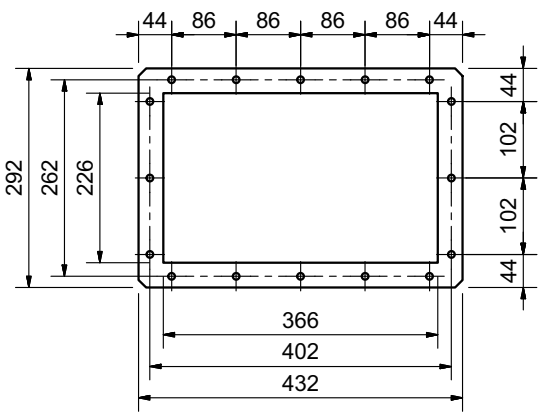




BOILER RECOMMENDED DRILLING TEMPLATE

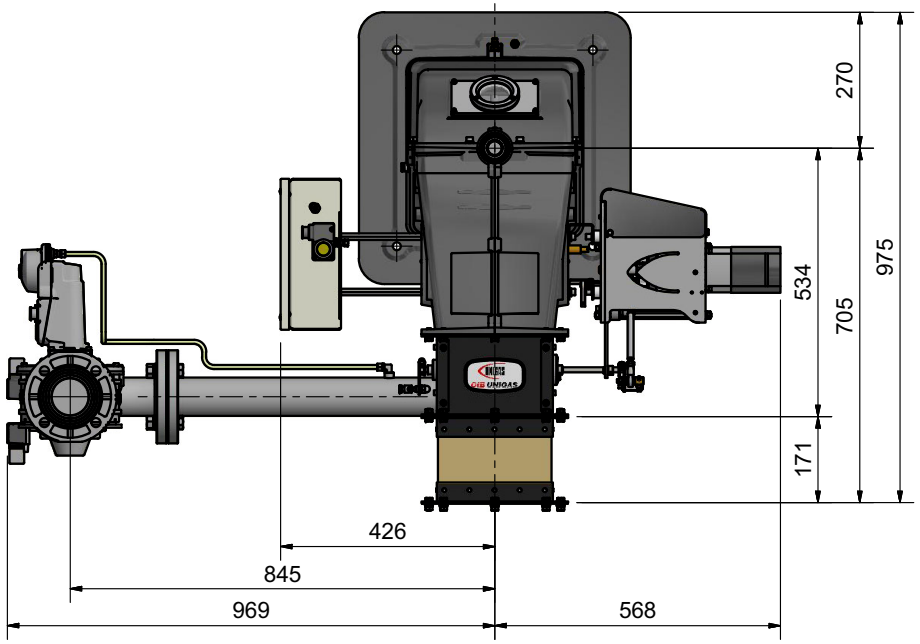


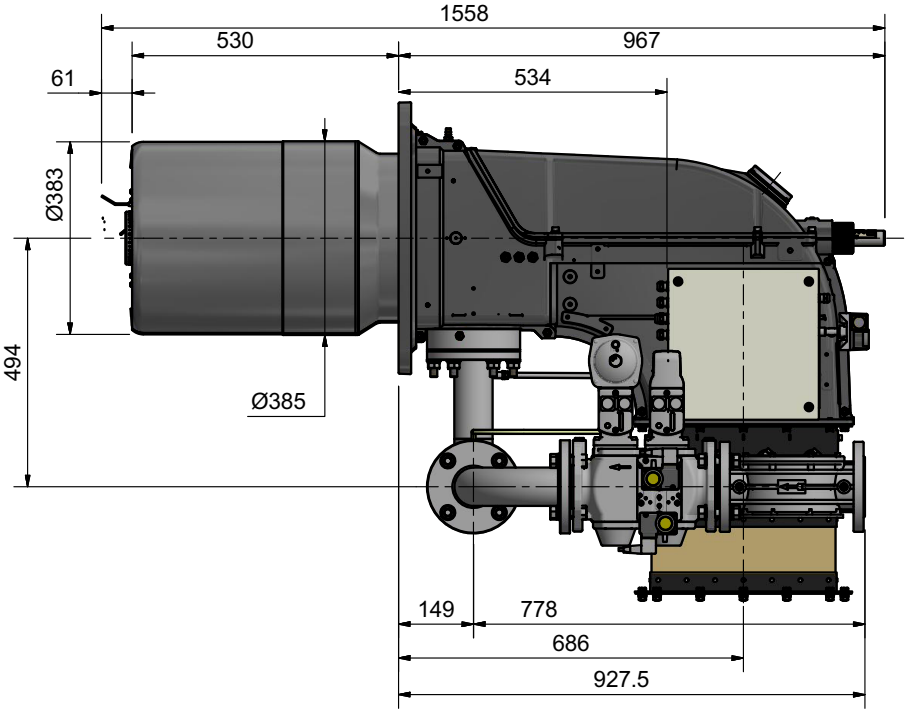
BURNER FLANGE

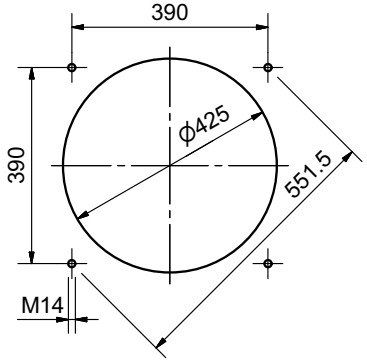


AIR INLET FLANGEI

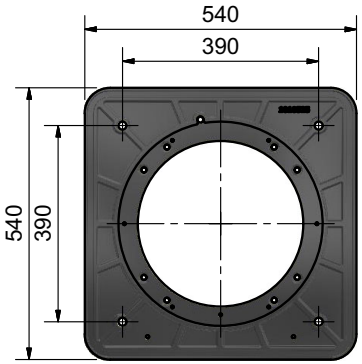
Overall dimensions (mm) **TLX520.1** *(1.65)*



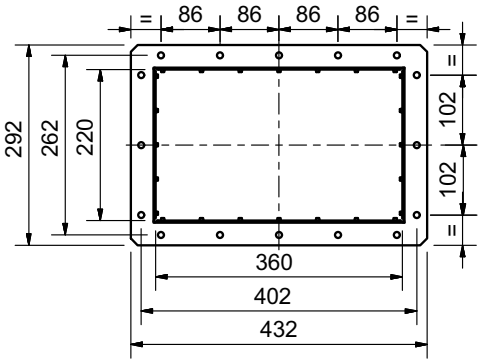




BOILER RECOMMENDED DRILLING TEMPLATE



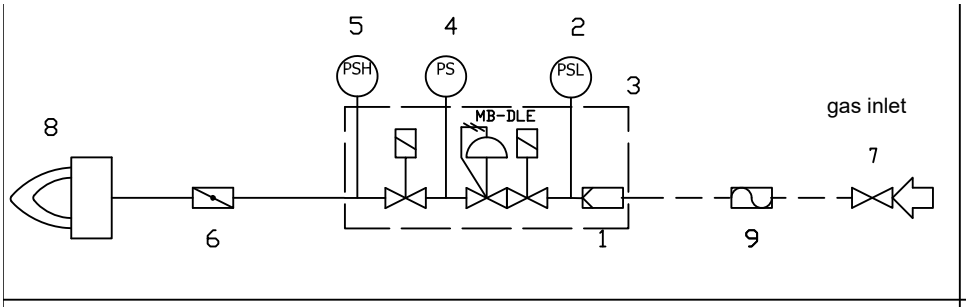
BURNER FLANGE



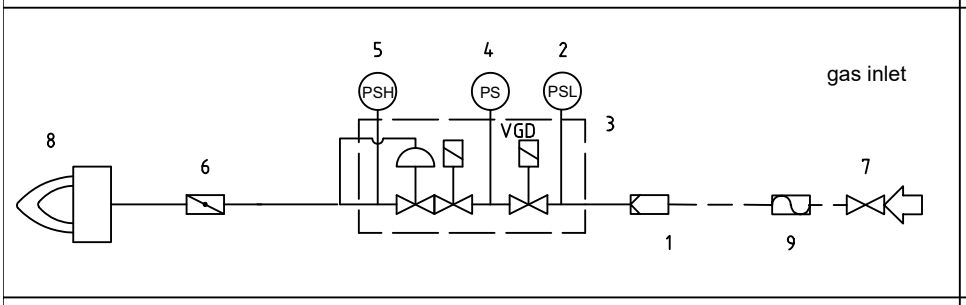
AIR INLET FLANGEI

GAS TRAIN CONNECTION

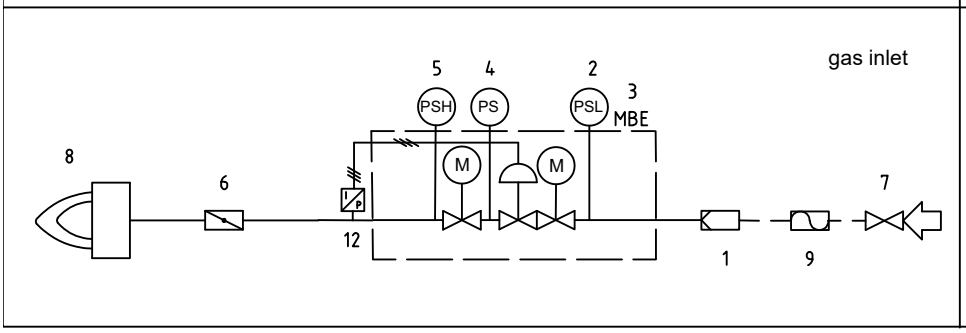
The following diagrams show some examples of possible gas trains with the components supplied with the burner and those fitted by the installer. The gas trains and the connection of the burner to the fuel supply line must be done in accordance with current local regulations.



con valvole MB-DLE



con valvole VGD



con valvole MBE

Legend:

1 Filter
2 Low pressure switch - PGMIN
3 Safety valve
4 Proving system pressure switch - PGCP (*optional)
5 High pressure switch PGMAX: mandatory for MBE, optional for VGD and DMV-DLE
6 Butterfly valve
7 Upstream manual valve
8 Main burner
9 Antivibration joint (*optional)
12 MBE pressure sensor

How to read the burner "Performance curve"

To check if the burner is suitable for the boiler to which it must be installed, the following parameters are needed:

- furnace input, in kW or kcal/h (kW = kcal/h/860);
- backpressure (data are available on the boiler ID plate or in the user's manual).

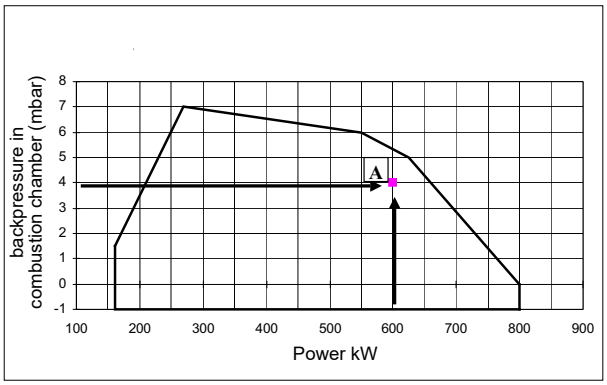
Example:

Furnace input: 600kW

Backpressure: 4 mbar

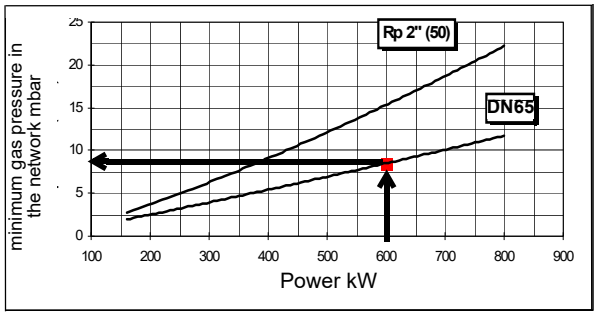
In the "Performance curve" diagram, draw a vertical line matching the furnace input value and an horizontal line matching the backpressure value. The burner is suitable if the intersection point A is inside the performance curve.

Data are referred to standard conditions: atmospheric pressure at 1013 mbar, ambient temperature at 15° C.



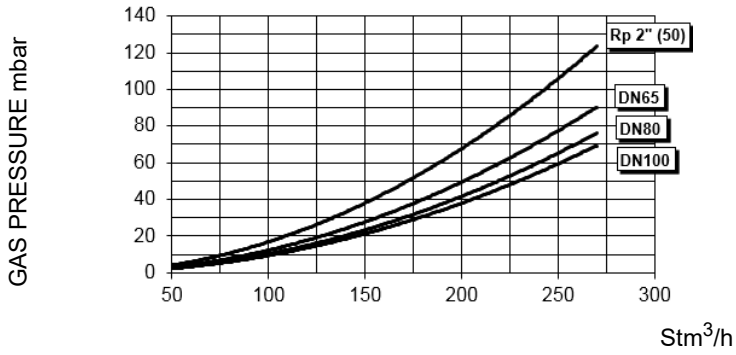
Checking the proper gas train size

To check the proper gas train size, it is necessary to the available gas pressure value upstream the burner's gas valve. Then subtract the backpressure. The result is called **pgas.** Draw a vertical line matching the furnace input value (600kW, in the example), quoted on the x-axis, as far as intercepitng the network pressure curve, according to the installed gas train (DN65, in the example). From the interception point, draw an horizontal line as far as matching, on the y-axis, the value of pressure necessary to get the requested furnace input. This value must be lower or equal to the **pgas** value, calculated before.

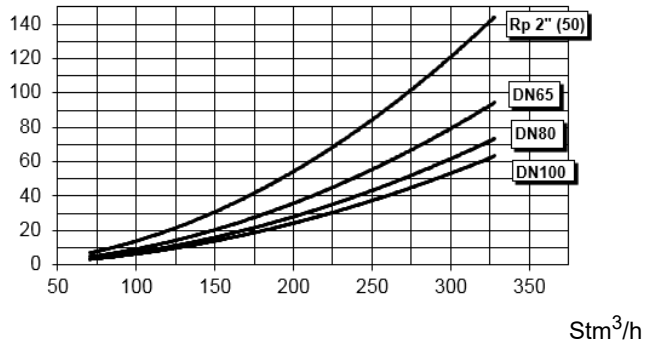


Pressure in the Network / gas flow rate curves (natural gas)

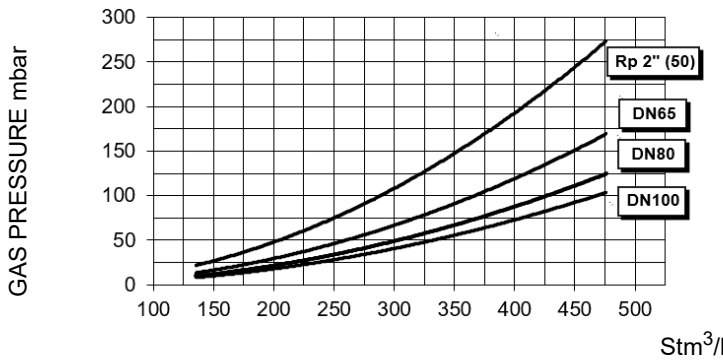
TLX92R M-..



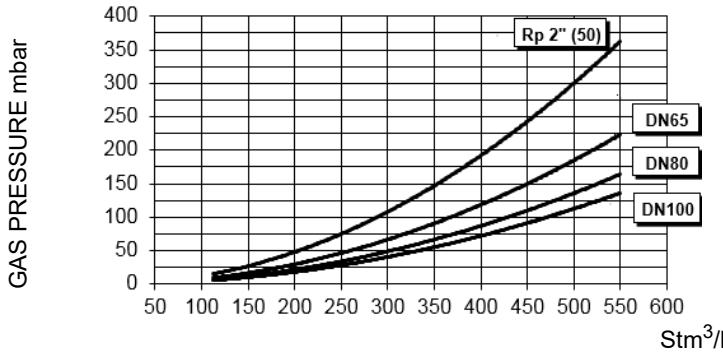
TLX92.1 M-..



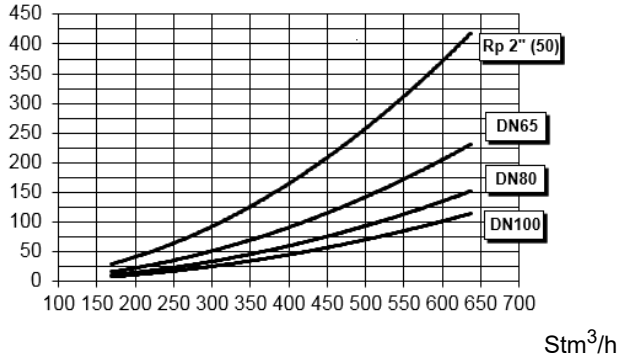
TLX512.1 M-..



TLX515.1 M-..



TLX520.1 M-..

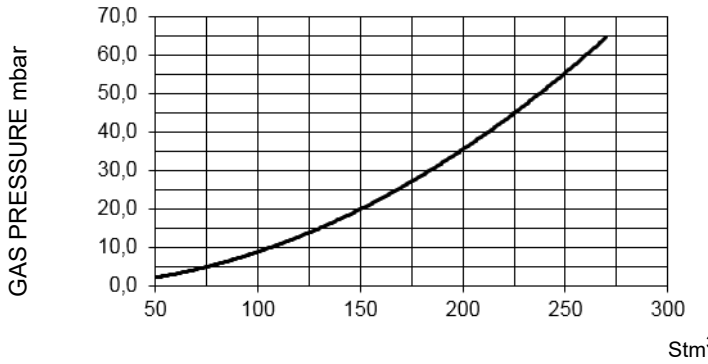


ATTENTION: the gas rate value is quoted on the x-axis, the related network pressure is quoted on the y-axis (pressure value in the combustion chamber is not included). To know the minimum pressure at the gas train inlet, necessary to get the requested gas rate, add the pressure value in the combustion chamber to the value read on the y-axis.

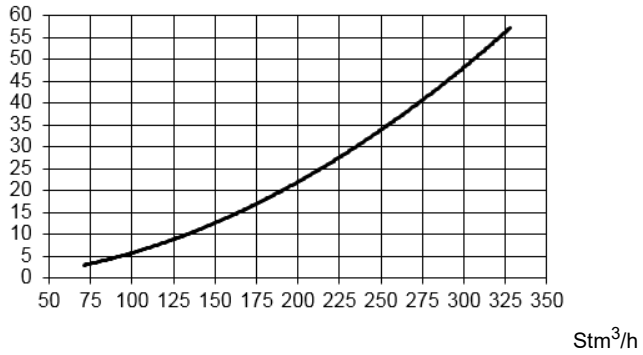
Gas pressure burner head vs natural gas flow rate

Curves are referred to pressure = 0 mbar in the combustion chamber!

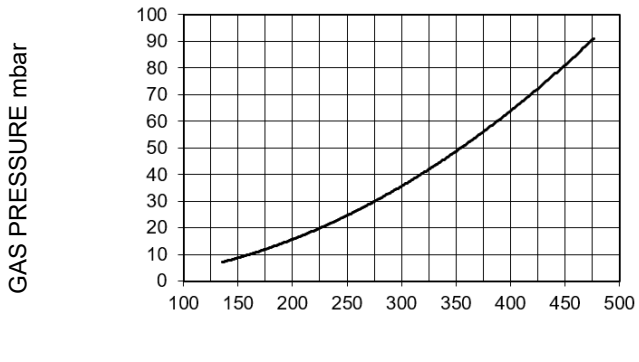
TLX92R M-..



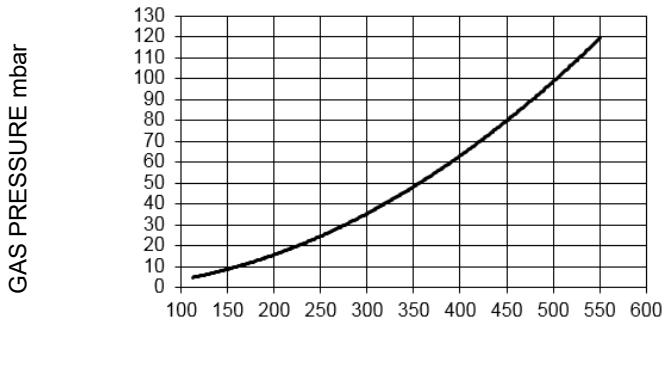
TLX92.1 M-..



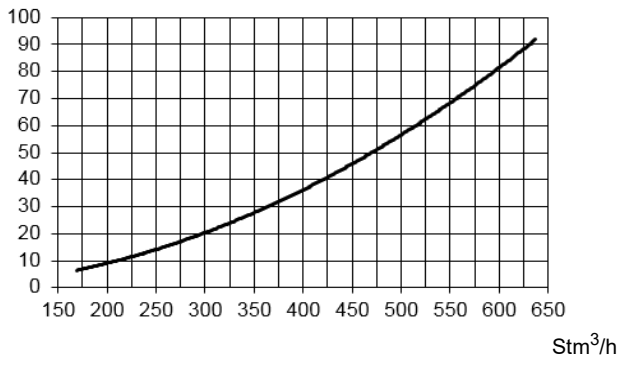
TLX512.1 M-..



TLX515.1 M-..



TLX520.1 M-..

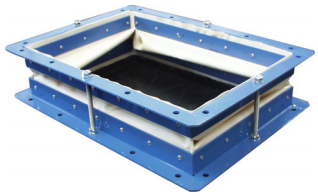


Fan installation

ATTENTION! The bellows unit provided is made of canvas and is provided with blocking spacers to avoid breaking it during installation: first place the bellows unit between flanges, then remove the spacers. Canvas has to be stretched after the installation, but not stressed.

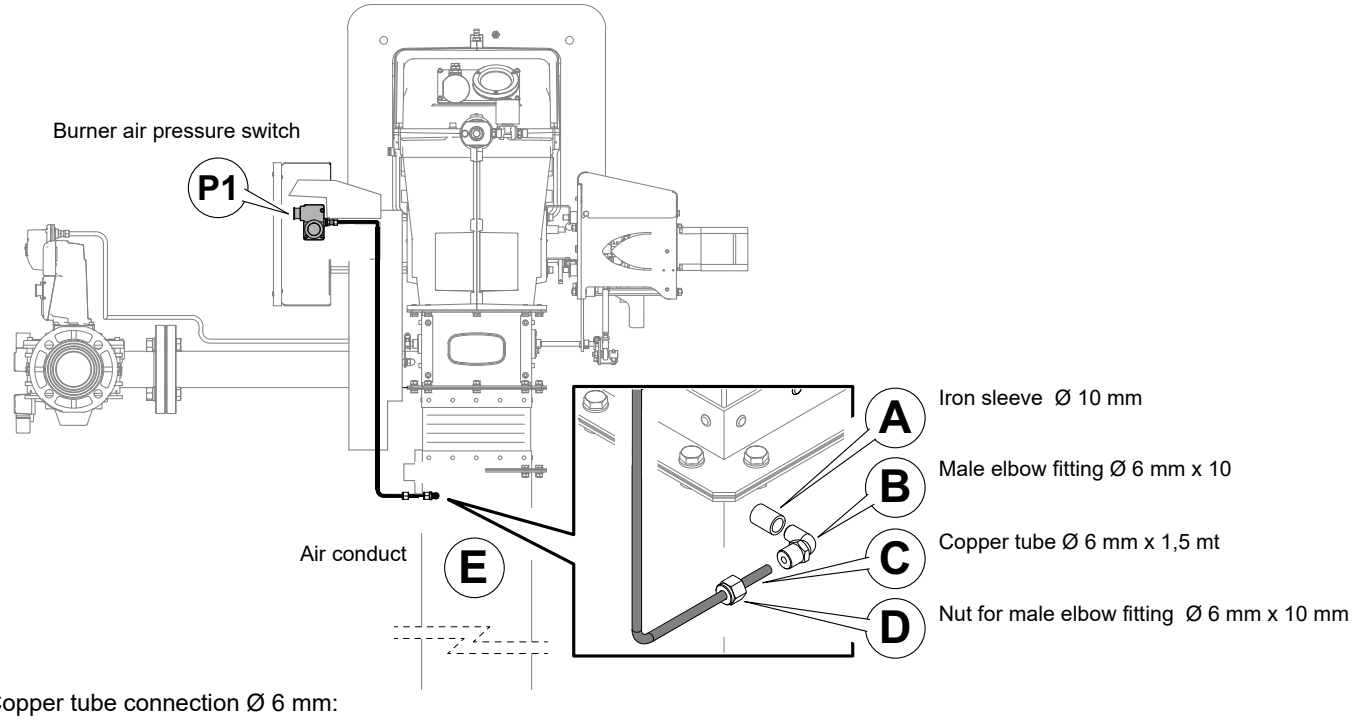
ATTENTION! the air duct dimensioning must be perforformed according to the flow rate, the temperature, the distance between the fan and the burner and according to the fan features as well..

ATTENTION! It is suggested to install the fan on vibration-damping supports in order to reduce vibration propagation.



Connect the air duct to the burner by means of the bellows unit provided together with the burner (see the picture below).

Connection diagram of the air pressure switch to the burner air conduct



Copper tube connection Ø 6 mm:

- Drill the air duct (with hole from Ø 10 mm);
- Fit sleeve **A** (Ø 10 mm) and weld it on channel **E**;
- Assemble in sequence the **B-D** details on the tube (Ø 6 mm) **C** appropriately shaped up to the connection on the air pressure switch (**P1**).

Picture refers to application with air pressure switch mounted on the junction box. Other applications are provided with air pressure switch mounted on the air damper.

PART II: INSTALLATION

Combustion head gas pressure curves

Combustion head gas pressure depends on gas flow and combustion chamber backpressure. When backpressure is subtracted, i depends only on gas flow, provided combustion is properly adjusted, flue gases residual O2 percentage complies with “Recommendec combustion values” table and CO in the standard limits). During this stage, the combustion head, the gas butterfly valve and the actuator are at the maximum opening. Refer to , showing the correct way to measure the gas pressure, considering the values o pressure in combustion chamber, surveyed by means of the pressure gauge or taken from the boiler’s Technical specifications.

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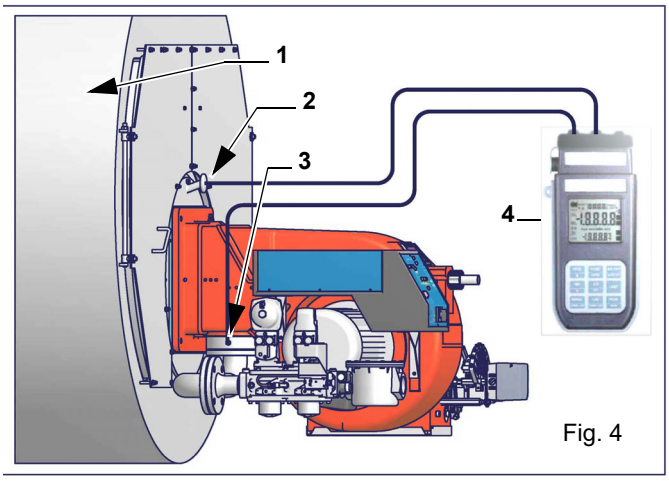


Fig. 4

Note: the figure is indicative only.

Key

1 Generator
2 Pressure outlet on the combustion chamber
3 Gas pressure outlet on the butterfly valve
4 Differential pressure gauge

ATTENTION: THE BURNED GAS RATE MUST BE READ AT THE GAS FLOW METER. WHEN IT IS NOT POSSIBLE, THE USER CAN REFERS TO THE PRESSURE-RATE CURVES AS GENERAL INFORMATION ONLY.

Measuring gas pressure in the combustion head

In order to measure the pressure in the combustion head, insert the pressure gauge probes: one into the combustion chamber’s pressure outlet to get the pressure in the combustion chamber and the other one into the butterfly valve’s pressure outlet of the burner. On the basis of the measured differential pressure, it is possible to get the maximum flow rate: in the pressure - rate curves (showed on the next paragraph), it is easy to find out the burner’s output in Stm^3/h (quoted on the x axis) from the pressure measured in the combustion head (quoted on the y axis). The data obtained must be considered when adjusting the gas flow rate.

MOUNTING AND CONNECTING THE BURNER

Transport and storage

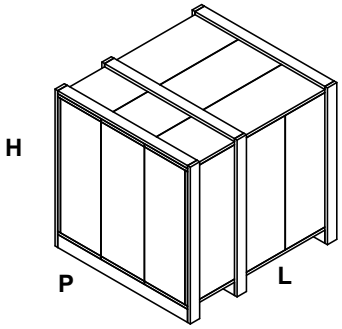
If the product must be stored, avoid humid and corrosive places. Observe the temperatures stated in the burner data table at the beginning of this manual. The packages containing the burners must be locked inside the means of transport in such a way as to guarantee the absence of dangerous movements and avoid any possible damage.

In case of storage, the burners must be stored inside their packaging, in storerooms protected from the weather. Avoid humid or corrosive places and respect the temperatures indicated in the burner data table at the beginning of this manual.

Packing

The burners are despatched in wooden crates whose dimensions are:

- **series: 1.734 mm x 1.440 mm x 1.140 mm (L x P x H)**



Packing cases of this type are affected by humidity and are not suitable for stacking.

The following are placed in each packing case:

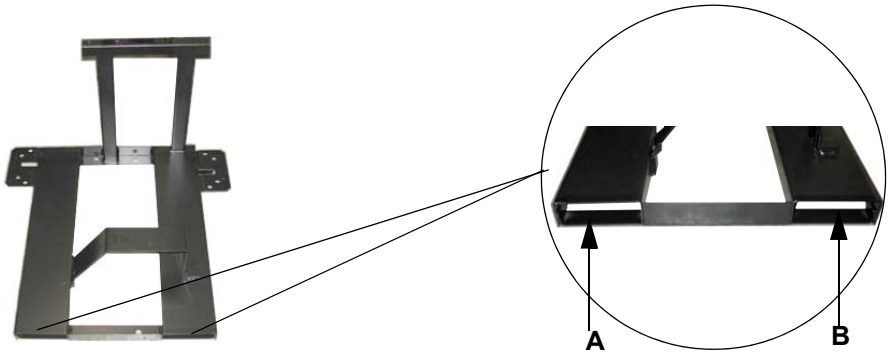
- burner with detached gas train;
- gasket or ceramic fibre plait (according to burner type) to be inserted between the burner and the boiler;
- envelope containing this manual and other documents.

To get rid of the burner’s packing, follow the procedures laid down by current laws on disposal of materials.

Handling the burner

WARNING! The handling operations must be carried out by specialised and trained personnel. If these operations are not carried out correctly, the residual risk for the burner to overturn and fall down still persists.
To move the burner, use means suitable to support its weight (see paragraph "Technical specifications").
The unpacked burner must be lifted and moved only by means of a fork lift truck.

The burner is mounted on a stirrup provided for handling the burner by means of a fork lift truck: the forks must be inserted into the A anb B ways. Remove the stirrup only once the burner is installed to the boiler.

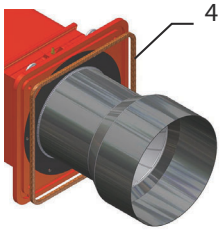


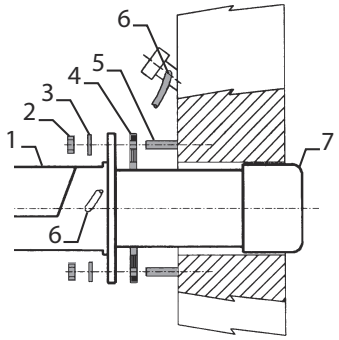
The burner is provided with eyebolts, for handling operations.

Fitting the burner to the boiler

To perform the installation, proceed as follows:

1 drill the furnace plateas decribed in paragraph (“Overall dimensions”);
2 place the burner towards the furnace plate: lift and move the burner by means of its eyebolts placed on the top side (see”Lifting and moving the burner”);
3 screw the stud bolts (5) in the plate holes, according to the burner’s drilling plate described on paragraph “Overall dimensions”;
4 place the ceramic fibre rope on the burner flange (if necessary, use a spray adhesive on the flange).
5 install the burner into the boiler;
6 fix the burner to the stud bolts, by means of the fixing nuts, according to the picture below.
7 After fitting the burner to the boiler, ensure that the gap between the blast tube and the refractory lining is sealed with appropriate insulating material (ceramic fibre cord or refractory cement).

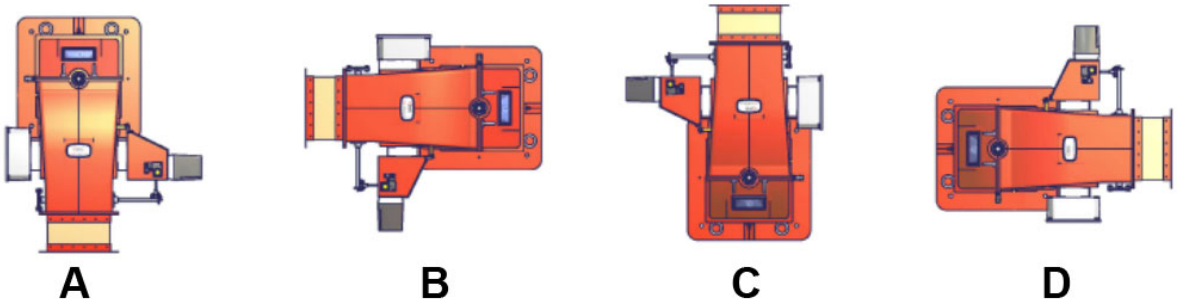




Keys

8
1 Burner
2 Fixing nut
3 Washer
4 Ceramic fibre plait
5 Stud bolt
7 Blast tube

Duo-block burner orientation.



Duo-block burner orientation to be specified at the order.

Matching the burner to the boiler (low NOx burners)

The burners described in this manual have been tested with combustion chambers that comply with EN676 regulation and whose dimensions are described in the diagram . In case the burner must be coupled with boilers with a combustion chamber smaller in diameter or shorter than those described in the diagram, please contact the supplier, to verify that a correct matching is possible, with respect of the application involved. To correctly match the burner to the boiler verify the type of the blast tube . Verify the necessary input and the pressure in combustion chamber are included in the burner performance curve; otherwise the choice of the burner must be revised consulting the burner manufacturer. To choose the blast tube lenght consider the following rule, even if it differs from the instructions of the boiler manufacturer: Cast-iron boilers, three pass flue boilers (with the first pass in the rear part): the blast tube must protrude at least 150÷200 mm into the combustion chamber.The length of the blast tubes does not always allow this requirement to be met, and thus it may be necessary to use a suitably-sized spacer to move the burner backwards.

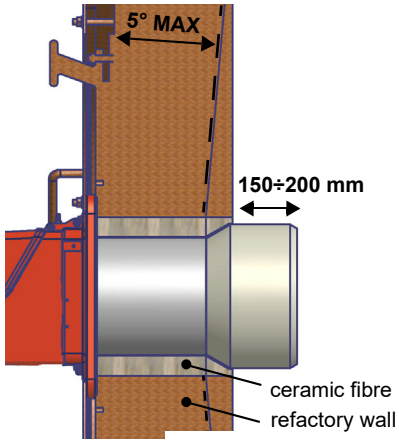


Fig. 4

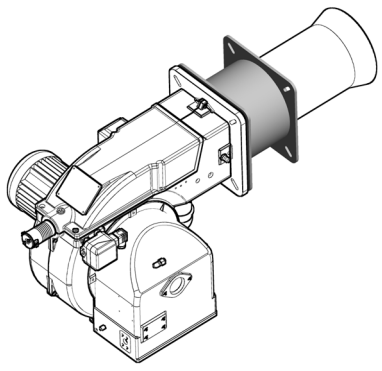


Fig. 5

WARNING! Carefully seal the free space between blast tube and the refractory lining with ceramic fibre rope or other suitable means.

GAS TRAIN CONNECTIONS

WARNING: before executing the connections to the gas pipe network, be sure that the manual cutoff valves are closed.

ATTENTION: it is recommended to mount filter and gas valves to avoid that extraneous material drops inside the valves, during maintenance and cleaning operation of the filters (both the filters outside the valves group and the ones built-in the gas valves).

ATTENTION: once the gas train is mounted, the gas proving test must be performed, according to the procedure set by laws in force.

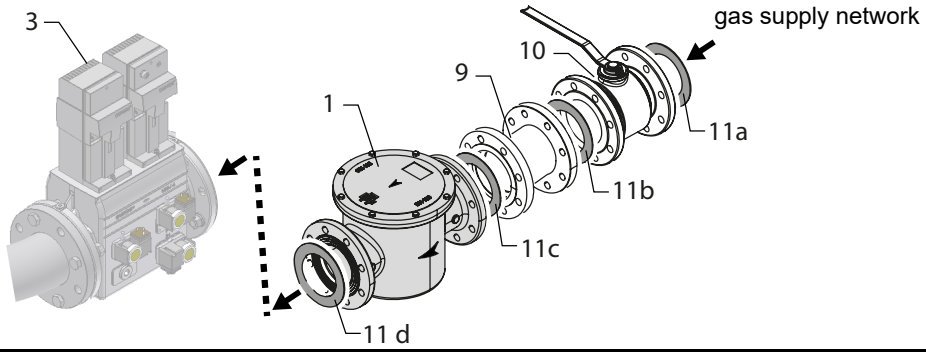
CAUTION: The direction of gas flow must follow the arrow on the body of the components mounted on the gas ramp (valves, filters, gaskets...).

NOTE: the bellows unit, the manual cutoff valve and the gaskets are not part of the standard supply

Following the "Hydraulic Schematics" section, the figure shows the components fitted by the installer.

Keys

1	Gas filter
3	Gas valves group
9	Bellows unit
10	Manual valve
11	Gasket(a, b, c, d)

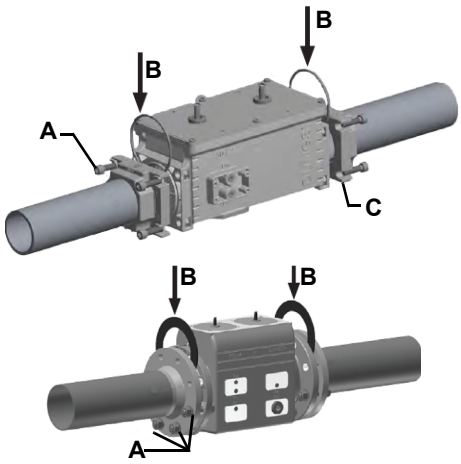


Procedure to install the double gas valve unit: **two (2) gas flanges are required; they may be threaded or flanged depending on size**

- **first step: install the flanges to prevent entry of foreign bodies in the gas line**
- **on the gas pipe, clean the already assembled parts and then install the valve unit check gas flow direction: it must follow the arrow on the valve body**
- **VGD20: make sure the O-rings are correctly positioned between the flanges and the valve**

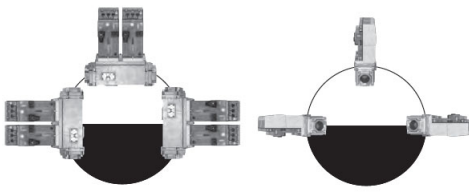
In all cases:

- ensure that the gaskets are correctly positioned between the flanges;
- fasten all the components with screws, according to the following diagrams:
- make sure bolts on the flanges are properly tightened
- check that the connections of all components are leak .



CAUTION: Use seals suitable for the gas used.

WARNING: Slowly open the fuel cock to avoid breaking the pressure regulator.



Gas Filter (if provided)

The gas filters remove the dust particles that are present in the gas, and prevent the elements at risk (e.g.: burner valves, counters and regulators) from becoming rapidly blocked. The filter is normally installed upstream from all the control and on-off devices.

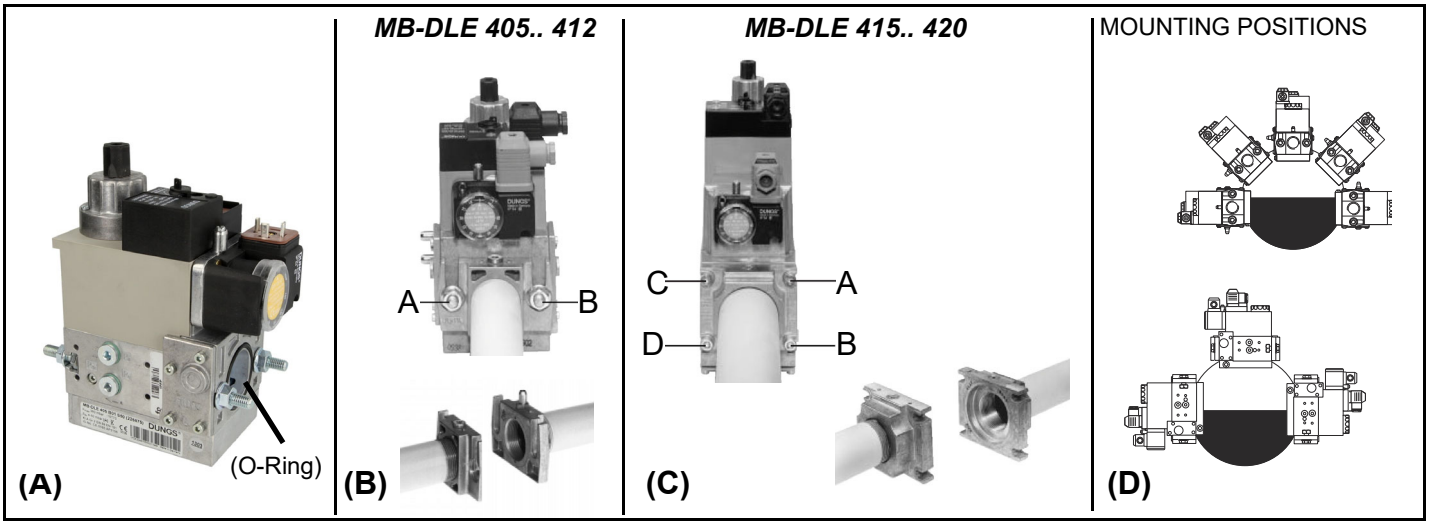
ATTENTION: it is reccomended to install the filter with gas flow parallel to the floor in order to prevent dust fall on the safety valve during maintenance operation.

Once the train is installed, connect the gas valves group and pressure switches plugs.

MultiBloc MB-DLE - *Assembling the gas train*

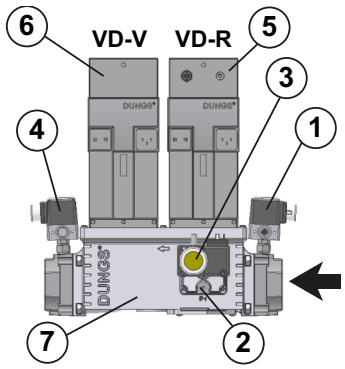
Mounting

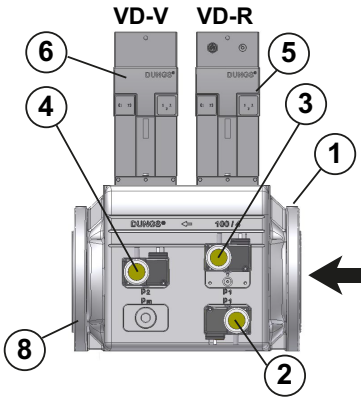
1 Mount flange onto tube lines: use appropriate sealing agent
2 Insert MB-DLE: note position of O rings
3 Remove MultiBloc between the threaded flanges
4 After installation, perform leakage and functional test
5 Disassembly in reverse order



DUNGS MBE

Components and position of pressure switches

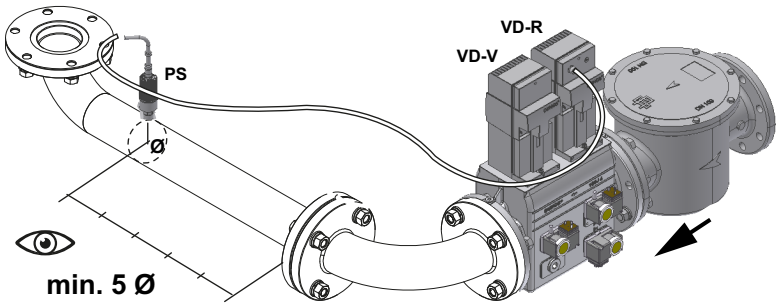


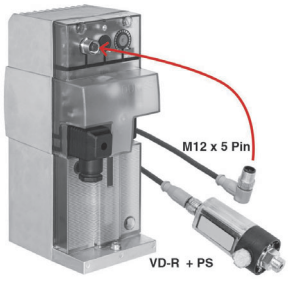


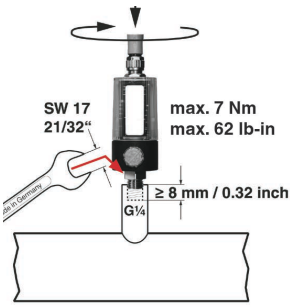
1 PGMIN minimum gas pressure switch
2 PGMIN minimum gas pressure switch (alternative to 1)
3 PGCP leakage control gas pressure switch
4 PGMAX maximum gas pressure switch
5 Actuator with integrated pressure stabiliser
6 On-Off actuator
7 Valve body (Threaded)
8 Valve body (Flange)

On equipment versions Facile VD-R must be installed upstream valve

PS pressure sensor connection to VD-R actuator and gas train

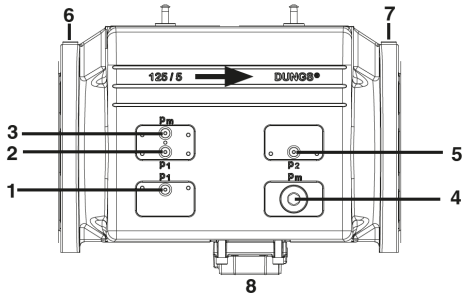


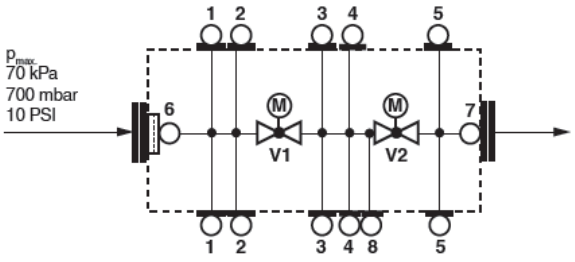




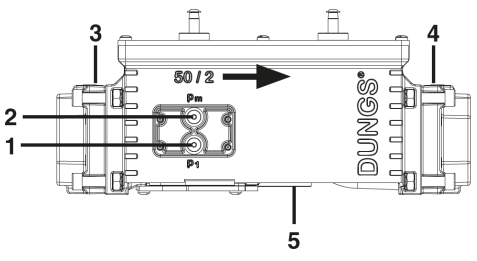
Attention: In the case of the MBE... valve, a pressure limit switch downstream of the safety valve is mandatory.

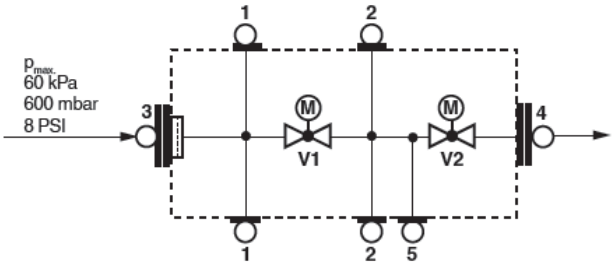
Pressure taps MultiBloc MBE





1, 2, 3, 5 Sealing plug G1/8 ISO 228
4 G3/4 for system accessories
6, 7 Sealing plug G1/4 ISO 228
8 For version VB…L only: connection for vent line
VB-2½L=1¼"NPT
VB-3L=1½"NPT
VB-4L=2"NPT
VB-5L=2"NPT

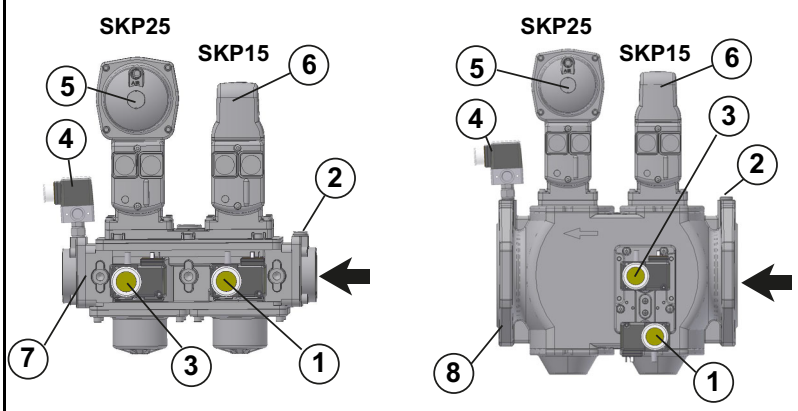




1, 2, 3, 4 Sealing plug G1/8 ISO 228
5 Locking screw
For version VB-2L only: connection for vent line **NPT 1**

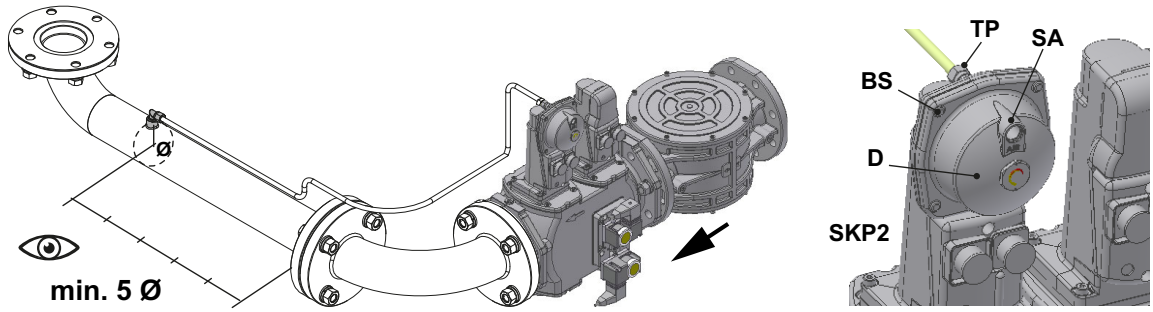
Siemens VGD20.. e VGD40..

Components and position of pressure switches



1 PGMIN minimum gas pressure switch
2 PGMIN minimum gas pressure switch (alternative to 1)
3 PGCP leakage control gas pressure switch
4 PGMAX maximum gas pressure switch
5 Actuator with integrated pressure stabiliser
6 On-Off actuator
7 Valve body (Threaded)
8 Valve body (Flange)

Connection of actuator SKP2... to gas train



Siemens SKP2.. (pressure governor)

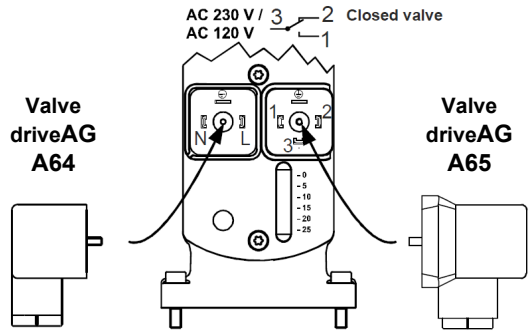
- Connect the reference gas pipe (**TP** in figure; 8mm-external size pipe supplied loose), to the gas pressure nipples placed on the gas pipe, downstream the gas valves: gas pressure must be measured at a distance that must be at least 5 times the pipe size.
- Leave the blowhole free (**SA** in figure). Should the spring fitted not permit satisfactory regulation, ask one of our service centres for a suitable replacement.

- D: pressure adjustment spring seat

WARNING: removing the four screws BS causes the device to be unserviceable!

version with SKP2 (built-in pressure stabilizer)Siemens VGD../VRD.. SKPx5 (Auxiliary-optional micro switch))Gas valve

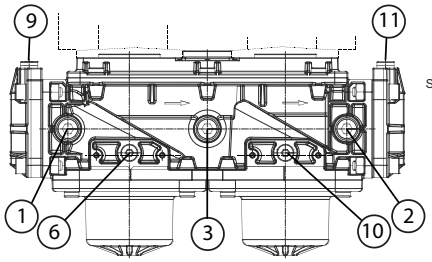
If the auxiliary microswitch (POC) is required, a dedicated actuator, different from the one usually supplied, must be ordered. The connection is shown in the figure.

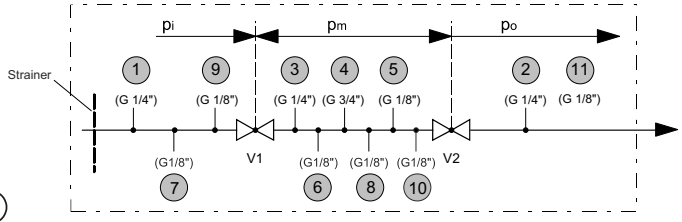


Valve driveAGA64 -
Plug connection ON-OFF
End of stroke

End of stroke
Plug connection **(POC)**

Siemens VGD *Pressure taps*



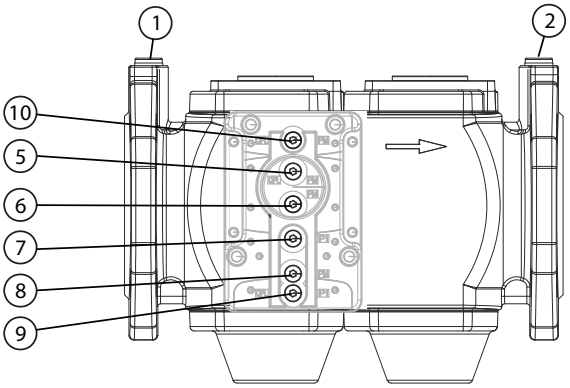


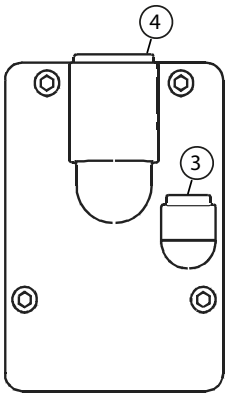
Legend

pi Inlet pressure

pm Pressure between valves

po Outlet pressure





ELECTRICAL CONNECTIONS

WARNING! Respect the basic safety rules. make sure of the connection to the earthing system. do not reverse the phase and neutral connections. fit a differential thermal magnet switch adequate for connection to the mains.

WARNING! before executing the electrical connections, pay attention to turn the plant's switch to OFF and be sure that the burner's main switch is in 0 position (OFF) too. Read carefully the chapter "WARNINGS", and the "Electrical connections" section.

ATTENTION: Connecting electrical supply wires to the burner teminal block MA, be sure that the ground wire is longer than phase and neutral ones.

To execute the electrical connections, proceed as follows:

1 remove the cover from the electrical board, unscrewing the fixing screws;
2 execute the electrical connections to the supply terminal board as shown in the attached wiring diagrams;
3 check the direction of the fan motor (see next paragraph);
1 refit the panel cover.

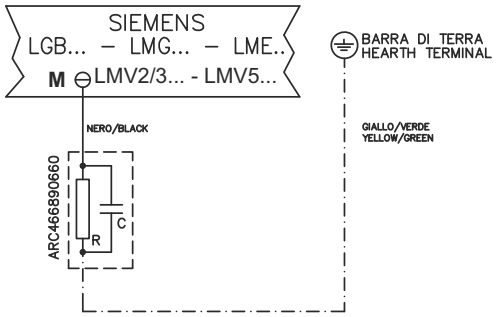
DANGER! Incorrect motor rotation can seriously damage property and injure people.

Note on electrical supply

In the case where the power supply of the AUXILIARIES of the phase-phase burner (without a neutral), for the flame detection it is necessary to connect the RC circuit Siemens between the terminal 2 (terminal X3-04-4 in case of LMV2x, LMV3x, LMV5x, LME7x) of the base and the earth terminal, RC466890660. For LMV5 control box, please refer to the clabeling recommendations avaible on the Siemens CD attached to the burner

Key

C - Capacitor (22 nF , 250 V)
LME / LMV - Siemens control box
R - Resistor (1 MΩ)
M: Terminal 2 (LGB, LME), Terminal X3-04-4 (LMV2x, LMV3x, LMV5, LME7x)
RC466890660 - RC Siemens filter



PART III: OPERATION

IN THE EVENT OF A BLOCKAGE, THE CAUSE MUST BE ASSESSED. IF THE FLAME BACKFIRE WARNING LIGHT IS ON, IT IS IMPERATIVE TO CHECK THE INTEGRITY AND GOOD CONDITION OF THE COMBUSTION HEAD AS DESCRIBED IN THE MAINTENANCE SECTION BEFORE UNLOCKING THE APPLIANCE.

LIMITATIONS OF USE

THE BURNER IS AN APPLIANCE DESIGNED AND CONSTRUCTED TO OPERATE ONLY AFTER BEING CORRECTLY CONNECTED TO A HEAT GENERATOR (E.G. BOILER, HOT AIR GENERATOR, FURNACE, ETC.), ANY OTHER USE IS TO BE CONSIDERED IMPROPER AND THEREFORE DANGEROUS.

THE USER MUST GUARANTEE THE CORRECT FITTING OF THE APPLIANCE, ENTRUSTING THE INSTALLATION OF IT TO QUALIFIED PERSONNEL AND HAVING THE FIRST COMMISSIONING OF IT CARRIED OUT BY A SERVICE CENTRE AUTHORISED BY THE COMPANY MANUFACTURING THE BURNER.

A FUNDAMENTAL FACTOR IN THIS RESPECT IS THE ELECTRICAL CONNECTION TO THE GENERATOR'S CONTROL AND SAFETY UNITS (CONTROL THERMOSTAT, SAFETY, ETC.) WHICH GUARANTEES CORRECT AND SAFE FUNCTIONING OF THE BURNER.

THEREFORE, ANY OPERATION OF THE APPLIANCE MUST BE PREVENTED WHICH DEPARTS FROM THE INSTALLATION OPERATIONS OR WHICH HAPPENS AFTER TOTAL OR PARTIAL TAMPERING WITH THESE (E.G. DISCONNECTION, EVEN PARTIAL, OF THE ELECTRICAL LEADS, OPENING THE GENERATOR DOOR, DISMANTLING OF PART OF THE BURNER).

NEVER OPEN OR DISMANTLE ANY COMPONENT OF THE MACHINE EXCEPT FOR ITS MAINTENANCE.

TO SECURE THE MACHINE, ACT ON THE ISOLATOR SWITCH. IN CASE OF ANOMALIES THAT REQUIRED A SHUT DOWN OF THE BURNER, IT'S POSSIBLE TO ACT ON THE AUXILIARY LINE SWITCH, LOCATED ON THE BURNER FRONT PANEL.

IN CASE OF A BURNER SHUT-DOWN, RESET THE CONTROL BOX BY MEANS OF THE RESET PUSHBUTTON. IF A SECOND SHUT-DOWN TAKES PLACE, CALL THE TECHNICAL SERVICE, WITHOUT TRYING TO RESET FURTHER.

WARNING: DURING NORMAL OPERATION THE PARTS OF THE BURNER NEAREST TO THE GENERATOR (COUPLING FLANGE) CAN BECOME VERY HOT, AVOID TOUCHING THEM SO AS NOT TO GET BURNT.



DANGER! Incorrect motor rotation can seriously damage property and injure people.

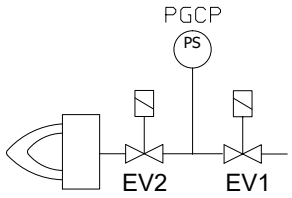
DANGER: During commissioning operations, do not let the burner operate with insufficient air flow (danger of formation of carbon monoxide); if this should happen, make the gas decrease slowly until the normal combustion values are achieved.

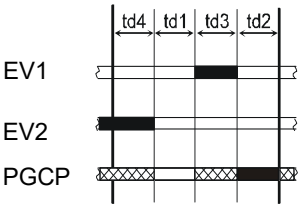
WARNING: before starting the burner up, be sure that the manual cutoff valves are open and check that the pressure upstream the gas train complies the value quoted on paragraph "Technical specifications". Be sure that the mains switch is closed.

Integrated proving system (burners equipped with LME7x, LMV, LDU)

This paragraph describes the integrated proving system operation sequence:

- At the beginning both the valves (EV1 and EV2) must be closed.
- Test space evacuating: EV2 valve (burner side) opens and keep this position for a preset time (td4), in order the bring the test space to ambient pressure.Test atmospheric pressure: EV2 closes and keep this position for a preset time (test time td1). The pressure switch PGCP has not to detect a rise of pressure.
- Test space filling: EV1 opens and keep this position for a preset time (td3), in order to fill the test space.
- Test gas pressure: EV1 closes and keep this position for a preset time (td2). The pressure switch PGCP has not to detect a pressure drop down.





If all of the test phases are passed the proving system test is successful, if not a burner lockout happens.

On LMV5x and LMV2x/3x and LME73 (except LME73.831BC), the valve proving can be parameterized to take place on startup, shutdown, or both. On LME73.831BC the valve proving is parameterized to take place on startup only.

Gas operation

- Check the gas feeding pressure is sufficient (signalling lamp **G3** on).
- **Burners fitted with gas proving system:** the gas proving system test begins; when the test is performed the proving system LED turns on. At the end of the test, the burner staring cycle begins: in case of leakage in a valve, the gas proving system stops the burner and the lamp **B1** turns on.

NOTE: if the burner is fitted with Dungs VPS504, the pre-purgue phase starts once the gas proving system is successfully performed. Since the pre-purgue phase must be carried out with the maximum air rate, the control box drives the actuator opening and when the maximum opening position is achieved, the pre-purge time counting starts.

- At the end of the pre-purge time, the actuator drives the complete closing (ignition with gas position) and, as this is achieved the ignition transformer is energised (LED **B4** is on); the gas valves open.
- Few seconds after the valves opening, the transformer is de-energised and lamp **B4** turns off.
- The burner is now operating, meanwhile the actuator goes to the high flame position and, after some seconds, the two-stage operation begins; the burner is driven automatically to high flame or low flame, according to the plant requirements.

Operation in high or low flame is signalled by lamp **B2** on the frontal panel.

AIR FLOW AND FUEL ADJUSTMENT

WARNING! During commissioning operations, do not let the burner operate with insufficient air flow (danger of formation of carbon monoxide); if this should happen, make the fuel decrease slowly until the normal combustion values are achieved.
WARNING! the combustion air excess must be adjusted according to the values in the following chart.

Recommended combustion parameters		
Fuel	Recommended (%) CO_2	Recommended (%) O_2
Natural gas	9 ÷ 10	3 ÷ 4.8
LPG	11 ÷ 12	2.8 ÷ 4.3

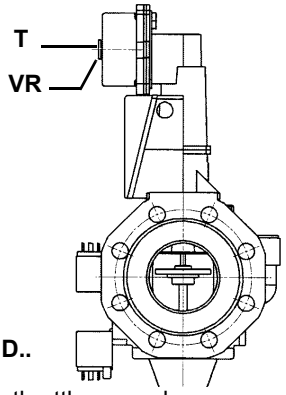
Adjustments - brief description

Adjust the air and gas flow rates at the maximum output (“high flame”) first, by means of the air damper and the adjusting cam respectively.

- Check that the combustion parameters are in the suggested limits.
- .Check the flow rate measuring it on the counter or, if it was not possible, verifying the combustion head pressure by means of a differential pressure gauge.
- Then, adjust the combustion values corresponding to the points between maximum and minimum: set the shape of the adjusting

8 acting on the pressure stabiliser of the valves group, adjust the **gas flow rate in the high flame stage** as to meet the values requested by the boiler/utilisation:

- Siemens VGD valves group: remove cap **T** and act on the **VR** adjusting screw to increase or decrease the pressure and consequently the gas rate; screwind **VR** the rate increases, unscrewing it decreases (see next figure).



Siemens VGD..

cam foil. The adjusting cam sets the air/gas ratio in those points, regulating the opening-closing of the throttle gas valve.

- Set, now, the low flame output, acting on the low flame microswitch of the actuator in order to avoid the low flame output increasing too much or that the flues temperature gets too low to cause condensation in the chimney.

Air and Gas Flow Rate Settings by means of Berger STM30../Siemens SQM40.. actuator

Air and Gas Flow Rate Settings by means of Berger STM30../Siemens SQM40.. actuator

1 check the fan motor rotation.

2 Only for burners provided with **Multibloc MB-DLE gas valves:** before starting the burner up, set the slow opening. To set the slow opening, remove cover **T**, reverse it upside down and use it as a tool to rotate screw **VR**. Clockwise rotation reduces start flow rate, anticlockwise rotation increases it. Do not use a screwdriver on the screw **VR**!

Note: the screw **VSB** must be removed only in case of replacemente of the coil.

3 Before starting the burner up, drive the high flame actuator microswitch matching the low flame one (in order to let the burner operates at the lowest output) to safely achieve the high flame stage.

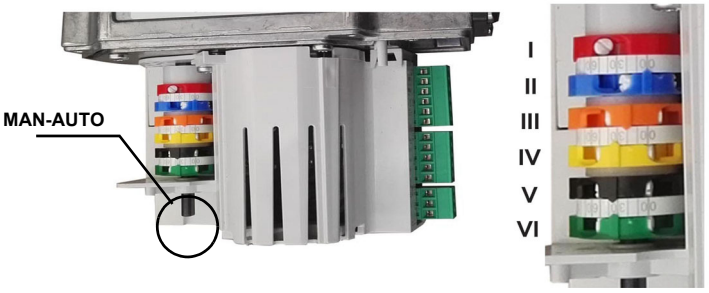
4 Start the burner up by means of the thermostat series and wait until the pre-purge time comes to an end and that the burner starts up;

5 drive the burner to high flame stage, by means fo the thermostat **TAB**.

6 Then move progressively the microswitch to higher values until it reaches the high flame position; always check the combustion values and eventually adjusting the gas by means of the valves group stabiliser.

7 go on adjusting air and gas flow rates: check, continuosly, the flue gas analisys, as to avoid combustion with little air; dose the air according to the gas flow rate change following the steps quoted below;

SQM40 Actuator cams



I	High flame
II	Stand-by
III	Low flame - gas
VI	Ignition - gas

9 Drive the burner to high flame stage (please refer to the LMVx documentation attached to this manual).

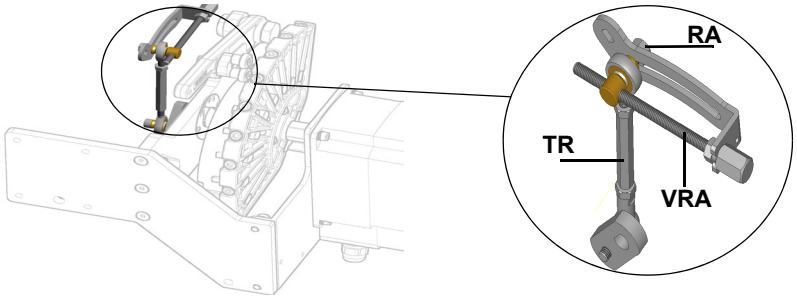
10 To adjust the **air flow rate in the high flame stage**, loose the **RA** nut and screw **VRA** as to get the desired air flow rate: moving the rod **TR** towards the air damper shaft, the air damper opens and consequently the air flow rate increases, moving it far from the shaft the air damper closes and the air flow rate decreases.

Note: once the procedure is perfomed, be sure that the blocking nut **RA** is fasten. Do not change the position of the air damper rods.

11 If necessary, adjust the combustion head position (see the dedicated paragraph).

12 The air and gas rate are now adjusted at the maximum power stage, go on with the point to point adjustement on the **SV1** (FGR side) adjusting cam as to reach the minimum output point.

13 Procedere, ora, alla regolazione dei pressostati.Now adjust the pressure switches.



14 If necessary, adjust the combustion head position (see the dedicated paragraph)..

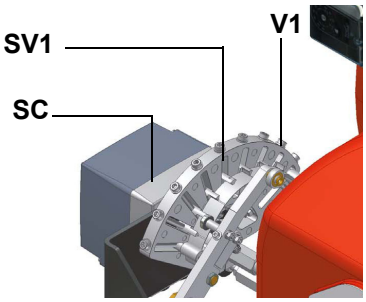
Attention! if it is necessary to change the head position, repeat the air and gas adjustments described above.

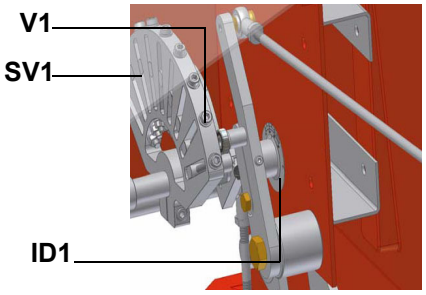
15 The air and gas rate are now adjusted at the maximum power stage, go on with the point to point adjustement on the **SV1** (gas side) adjusting cam as to reach the minimum output point.

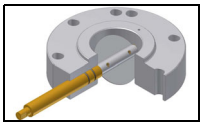
16 as for the point-to-point regulation, move the gas low flame microswitch a little lower than the maximum position (90°);

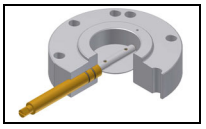
17 set the **TAB** thermostat to the minimum in order that the actuator moves progressively towards the low flame position;

18 move the gas low flame microswitch to the minimum to move the actuator towards the low flame until the two bearings find the adjusting screw that refers to the lower position: screw **V1** to increase the rate, unscrew to decrease.






Gas throttle valve open


Gas throttle valve closed

19 Move again the gas low flame microswitch towards the minimum to meet the next screw on the adjusting cam and repeat the previous step; go on this way as to reach the desired low flame point.

20 Now adjust the pressure switches.

21

22

AIR FLOW AND FUEL ADJUSTMENT

WARNING! During commissioning operations, do not let the burner operate with insufficient air flow (danger of formation of carbon monoxide); if this should happen, make the fuel decrease slowly until the normal combustion values are achieved.
WARNING! the combustion air excess must be adjusted according to the values in the following chart.

Recommended combustion parameters		
Fuel	Recommended (%) CO_2	Recommended (%) O_2
Natural gas	9,0 ÷ 10	3,0 ÷ 4,8

(First) Start-up preliminary operations - gas supply

Recommended actions to be carried out in sequence:

1 Check the burner and all its components are installed correctly
2 Check that all electrical and mechanical parts are connected correctly
3 Check that there is water or other vector fluids in the generator
4 Check that the ventilation gates/dampers in the plant are open and the stack is free
5 Connect the gauges used to adjust and check pressures on the incoming line and on the head, air and fuel side.
6 Open the thermostatic series and the safety chain
7 Turn the main switch on the panel front with the "ON/OFF" selector to position "ON".
8 Check the phase and neutral position is correct
9 Open the manual shut-off valves slowly, in order to prevent any water hammers that might seriously damage valves and pressure regulator
10 Check the sense of rotation of the electrical motors
11 Bleed the line, getting rid of all the air in the pipe as far as the main gas valve
12 Ensure the pressure entering the main valves is not excessive due to damage to or wrong adjustment of the line pressure regulator
13 Ensure the gas supply minimum pressure is at least equal to the pressure required by the pressure curves - burnt gas flow

DANGER! Venting the air from the piping must take place in safe conditions, avoiding dangerous concentrations of fuel in the rooms. You must therefore ventilate the rooms and wait long enough for the gases to dissipate outside before switching on.

ADJUSTING THE GAS VALVES GROUP

Multibloc MB-DLE

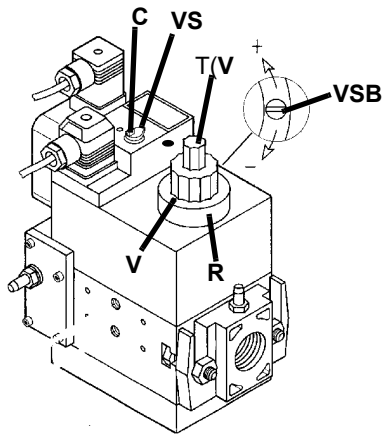
The multibloc unit is a compact unit consisting of two valves, gas pressure switch, pressure stabilizer and gas filter.

The valve is adjusted by means of the **RP** regulator after slackening the locking screw **VB** by a number of turns. By unscrewing the regulator **RP** the valve opens, screwing the valve closes. To set the fast opening remove cover **T**, reverse it upside down and use it as a tool to rotate screw **VR**. Clockwise rotation reduces start flow rate, anticlockwise rotation increases it.

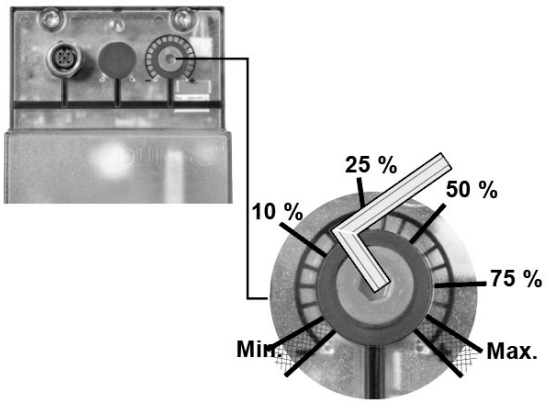
Do not use a screwdriver on the screw **VR**!

The pressure stabilizer is adjusted by operating the screw **VS** located under the cover **C**. By screwing down the pressure is increased and by unscrewing it is reduced.

Note: the screw **VSB** must be removed only in case of replacemente of the coil.



MultiBloc MBE *Regulation VD-R whith PS*

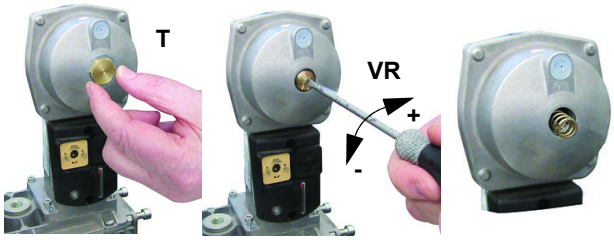


Outlet pressure	MIN	10%	25%	50%	75%	MAX
PS-10/40	4 mbar 0,4 kPa 2 "w.c.	10 mbar 1,0 kPa 4 "w.c.	25 mbar 2,5 kPa 10 "w.c.	50 mbar 5,0 kPa 20 "w.c.	75 mbar 7,5 kPa 30 "w.c.	100 mbar 10,0 kPa 40 "w.c.
PS-50/200	20 mbar 2,0 kPa 8 "w.c.	50 mbar 5,0 kPa 20 "w.c.	125 mbar 12,5 kPa 50 "w.c.	250 mbar 25,0 kPa 100 "w.c.	375 mbar 37,5 kPa 150 "w.c.	500 mbar 50,0 kPa 200 "w.c.

Caution: check that the range of the installed spring is compatible with the gas pressure at the burner head (see appropriate diagram) to which must be added the back pressure and approx. 5 /10 mbar for various leaks and gas line.

While making outlet pressure adjustments, do not exceed a value that creates a hazardous condition to the burner!

Siemens VGD../VRD.. version with SKP2



Performance range (mbar)			
	neutral	**yellow**	**red**
Spring colour SKP 25.0	0 ÷ 22	15 ÷ 120	100 ÷ 250
Spring colour SKP 25.4		7 ÷ 700	150 ÷ 1500

The pressure adjusting range, upstream the gas valves group, changes according to the spring provided with the valve group.
To replace the spring supplied with the valve group, proceed as follows:i

To increase or decrease gas pressure, and therefore gas flow rate, remove the cap **T** and use a screwdriver to adjust the regulating screw **VR**. Turn clockwise to increase the flow rate, counterclockwise to reduce it.

Calibration air and gas pressure switches



The **air pressure switch** locks the control box if the air pressure is not the one requested. If it happens, unlock the burner by means of the control box unlock pushbutton, placed on the burner control panel.

The **gas pressure switches** check the pressure to avoid the burner operate when the pressure value is not in the requested pressure range.

Calibration of low gas pressure switch

With the burner operating at maximum power, increase the regulation pressure by slowly turning the control knob clockwise until the burner stops, taking care it does not go into lockout and the display shows the error "**Err c20 d0**".

As for the gas pressure switch calibration, proceed as follows:

- Be sure that the filter is clean.
- Remove the transparent plastic cap.
- While the burner is operating at the maximum output, test the gas pressure on the pressure port of the minimum gas pressure switch.
- Slowly close the manual cutoff valve (placed upstream the pressure switch, see gas train installation diagram), until the detected pressure is reduced by 50%. Pay attention that the CO value in the flue gas does not increase: if the CO values are higher than the limits laid down by law, slowly open the cutoff valve as to get values lower than these limits.
- Check that the burner is operating correctly.
- Clockwise turn the pressure switch adjusting ring nut (as to increase the pressure value) until the burner stops.
- Slowly fully open the manual cutoff valve.
- Refit the transparent plastic cover on the pressure switch.

Calibration the maximum gas pressure switch (when provided)

To calibrate the maximum pressure switch, proceed as follows according to its mounting position:

- remove the pressure switch plastic cover;
- if the maximum pressure switch is mounted upstreaam the gas valves: measure the gas pressure in the network, when flame is off; by means of the adjusting ring nut **VR**, set the value read, increased by the 30%.
- if the maximum pressure switch is mounted downstream the “gas governor-gas valves” group and upstream the butterfly valve: light the burner, adjust it according to the procedure in the previous paragrph. Then, measure the gas pressure at the operating flow rate, downstream the “gas governor-gas valves” group and upstream the butterfly valve; by means of the adjusting ring nut **VR**, set the value read on step 2, increased by the 30%;
- replace the plastic cover.

Calibration of air pressure switch

To calibrate the air pressure switch, proceed as follows:

- Remove the transparent plastic cap.
- Once air and fuel setting have been accomplished, startup the burner.
- During the pre-purge phase o the operation, turn slowly the adjusting ring nut **VR** in the clockwise direction (to increase the adjusting pressure) until the burner lockout, then read the value on the pressure switch scale and set it to a value reduced by 15%.
- Repeat the ignition cycle of the burner and check it runs properly.
- Refit the transparent plastic cover on the pressure switch.

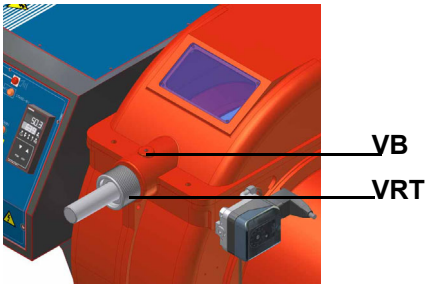
Calibration gas leakage pressure switch (PGCP)

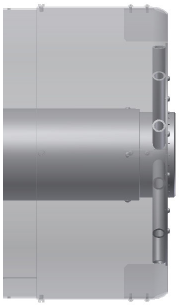
- remove the pressure switch plastic cover;
- adjust the PGCP pressure switch to the same value set for the minimum gas pressure switch;
- replace the plastic cover.

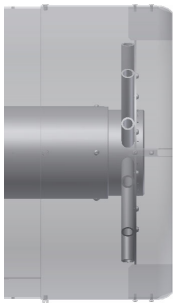
Adjusting the combustion head

Attention! if it is necessary to change the head position, repeat the air and fuel adjustments described above.

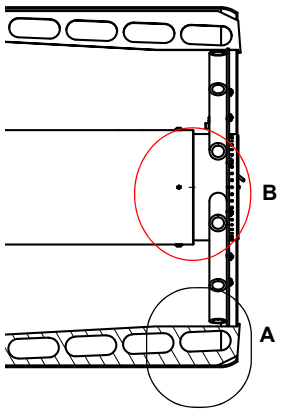
.The combustion head position affects the flame stability.The diffuser position must be set during the commissioning according to the regulation needs. The diffuser position is factory set as shown in figure ”A” (x = 10 mm). If different settings are required, it is possible to change the position: loosen the VB screw and slightly move the combustion head backwards, turning clockwise the knob VRT. Fasten VB screw when the adjustment is accomplished.

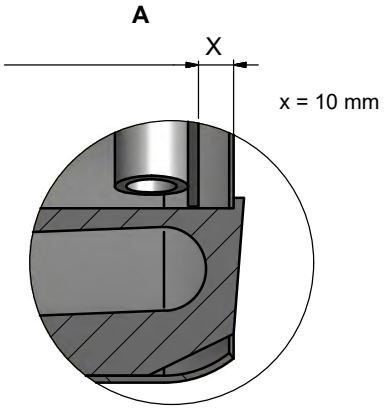


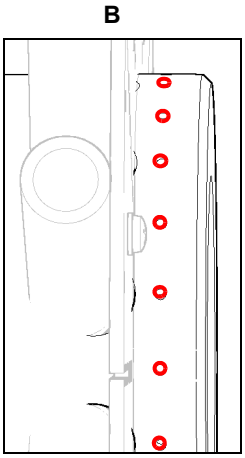

“all-ahead” position


“all-backwards” head position

The diffuser position must be set during the commissioning according to the regulation needs. The diffuser position is factory set as shown in figure ”A” (x = 10 mm)
Depending on the boiler application, it is possible to act on the holes (figure B) to improve the flame stability and NOx, CO emission values. If necessary, close/open the holes in figure “B” using the screws kit given with the burner.







PART IV: MAINTENANCE

At least once a year carry out the maintenance operations listed below. In the case of seasonal servicing, it is recommended to carry out the maintenance at the end of each heating season; in the case of continuous operation the maintenance is carried out every 6 months.

WARNING: ALL OPERATIONS ON THE BURNER MUST BE CARRIED OUT WITH THE MAINS DISCONNECTED AND THE FUEL MANAUL CUTOFF VALVES CLOSED!
ATTENTION: READ CAREFULLY THE "WARNINGS" CHAPTER AT THE BEGINNIG OF THIS MANUAL.

ROUTINE MAINTENANCE

- Check that the gas meter is not moving when the burner is off. In case it is rotating, look for possible leaks.
- Check the cleaning condition of the vent. Clean the vent by using exclusively a dry brush. If needed, disassemble it from the motor's shaft and wash it by using non corrosive detergents. Prior to disassemble the vent, take the measurements in relation to the motor's shaft, so as to reassemble it in the same position.
- Check that all parts in contact with combustive air (air box, protection mesh and Archimedean screw) are clean and free from any obstruction that might impede free afflux. Clean it with compressed air if available and/or a dry brush or cloths. Eventually wash it with non corrosive detergents.
- Check the blast tube; it must be substituted in case of obvious cracks or anomalous holes. Slight deformations that do not affect combustion may be tolerated
- Check the condition of the burner-boiler gasket. Eventually substitute it.
- Check the fan's motor: no specific maintenance is needed. In case of anomalous noises when running, check the condition of the bearings and eventually substitute them or completely substitute the motor.
- Clean and examine the gas filter cartridge and replace it if necesssary;
- Remove and clean the combustion head;
- Examine and clean the ignition electrodes, adjust and replace them if necessary;
- Examine and clean the detection electrode/photoelement (according to the burner models), replace it if necessary, in case of doubt, check the detection circuit, after the burner start-up;
- Clean and grease leverages and rotating parts.
-

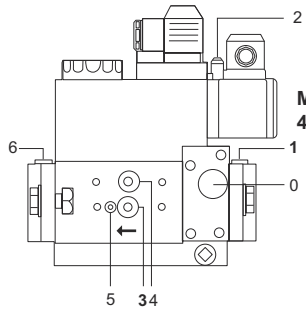
ATTENTION: when servicing, if it was necessary to disassemble the gas train parts, remember to execute the gas proving test, once the gas train is reassembled, according to the procedure imposed by the law in force.

-
- At least every 2 months, or more often if needed, clean the room where the burner is installed.Avoid leaving installations, papers, nylon bags, etc., inside the room. They could be sucked by the burner and cause malfunctioning.
- Check that the room's vents are free from obstructions.

Gas filter maintenance

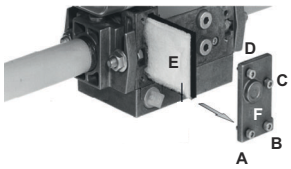
WARNING: Before opening the filter, close the manual cutoff valve downstream the filter and bleed the gas; check that inside the filter there is no pressurised gas.

Per pulire o sostituire il filtro gas procedere nel modo seguente:

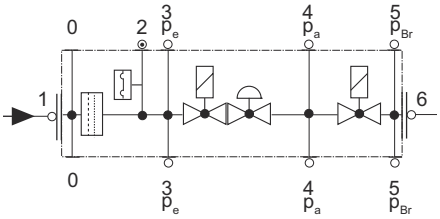


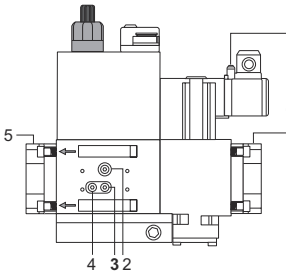
MB-DLE
405..412

0 Filter cover
1, 3,4 , 6 Screw plug G 1/8
2 Meter connection
5 Screw plug M14



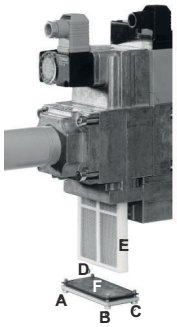
Pressure taps



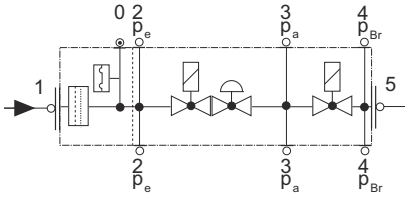


MB-DLE
415 - 420 B01

0, 1, 2, 3, 4, 5
Bouchon à vis G 1/8



Pressure taps



- Check the filter at least once a year!
- Change the filter if the pressure difference between pressure connection 1 and 3 (Fig. 1-Fig. 3)is $\Delta p > 10$ mbar.
- Change the filter if the pressure difference between pressure connection 1 and 3 (Fig. 1-Fig. 3) is twice as high compared to the last check.

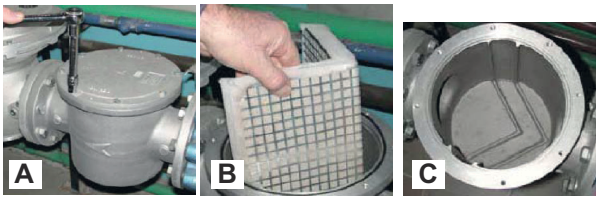
You can change the filter without removing the fitting.

1 Interrupt the gas supply closing the on-off valve.
2 Remove screws 1 ÷ 4 using the Allen key n. 3 and remove filter cover 5 in Fig. 5.
3 Remove the filter 6 and replace with a new one.
4 Replace filter cover 5 and tighten screws 1 ÷ 4 without using any force and fasten.
5 Perform leakage and functional test, $p_{max.}$ = 360 mbar.

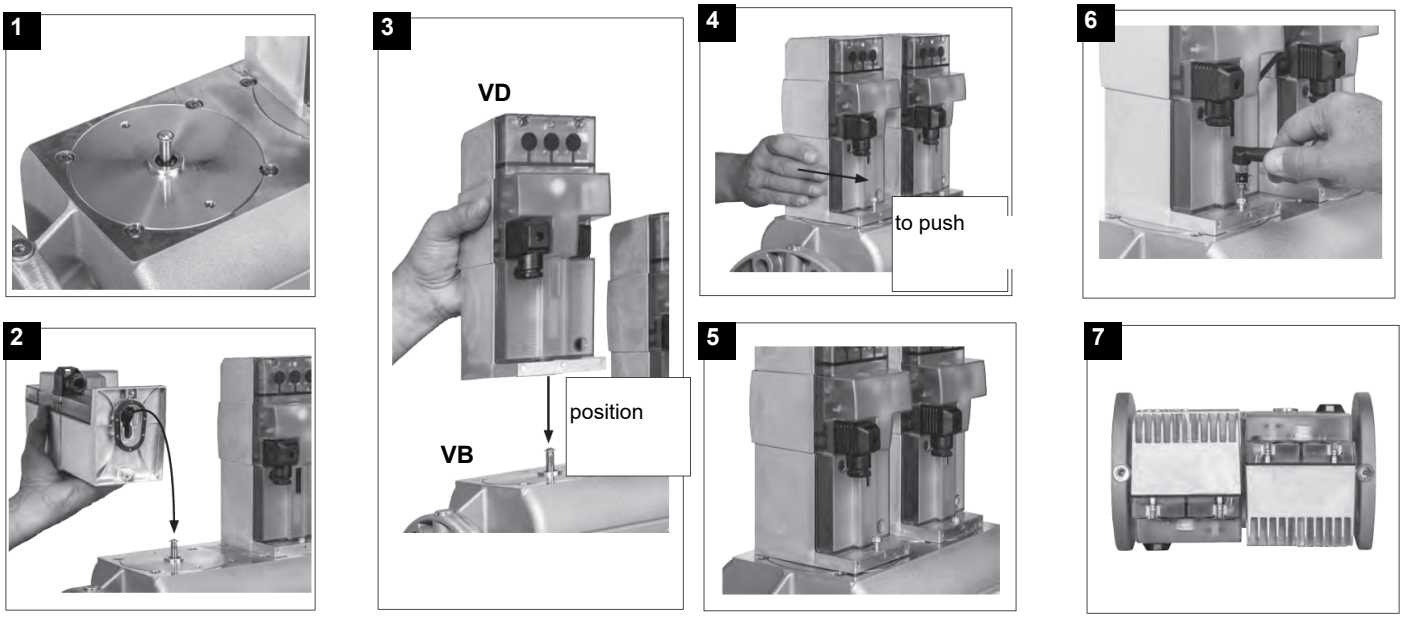
To clean or remove the filter, proceed as follows:

1 remove the cap unscrewing the fixing screws (A);
2 remove the filtering cartridge (B), clean it using water and soap, blow it with compressed air(or replace it, if necessary)
3 replace the cartridge in its proper position taking care to place it inbetween the guides as not to hamper the cap replacement;

be sure to replace the “O” ring into its place (C) and replace the cover fastening by the proper screws (A).

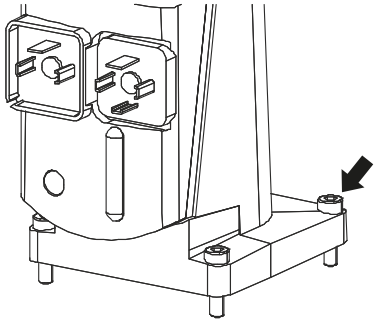


MultiBloc VD-V VD-R Mounting

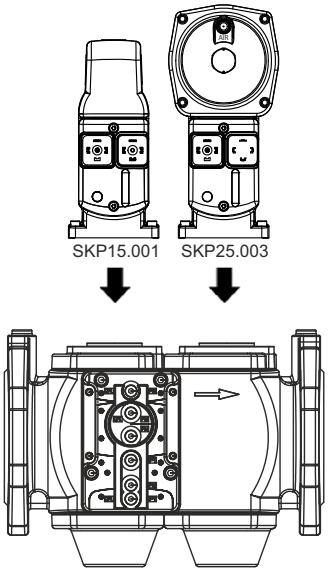


1. Position VD on VB, fig. 2+3.
2. Slide VD forward up to the stop, fig. 4.
3. Screw VD on with 2 M5 screws for each, max. 5 Nm/44 in.-lb., fig. 5/6.
4. VD can be mounted rotated by 180°, fig. 7.

Siemens SKP15 e SKP25 Mounting



To replace the actuators, turn the screws as shown in the drawing.

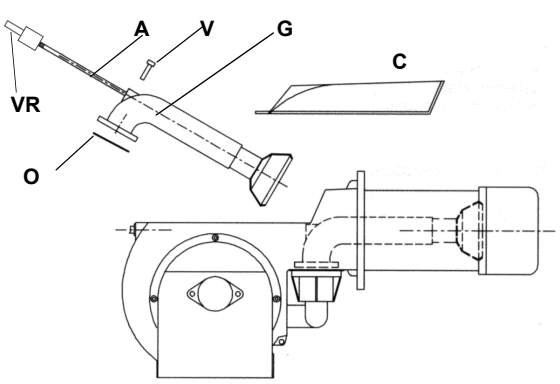


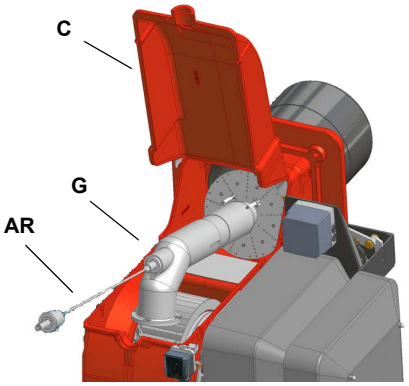
Removing the combustion head

Attention: before adjusting the combustion head, turn the burner off and wait until it gets cold.

- Remove the cover **C**.
- remove the electrodes cables;
- unscrew the 3 screws **V** which hold in position the gas manifold **G** and pull out the complete group as shown in the picture below.
- Clean the combustion head by a compressed air blow or, in case of scale, scrape it off by a scratchbrush.

Note: to replace the combustion head reverse the procedure described above having care to place correctly the O ring (**OR**) between burner and gas manifold.





Key	
VRT	Head adjusting screw
AR	Threaded rod
V	Fixing screw
G	Gas manifold
OR	”O” ring
C	Cover

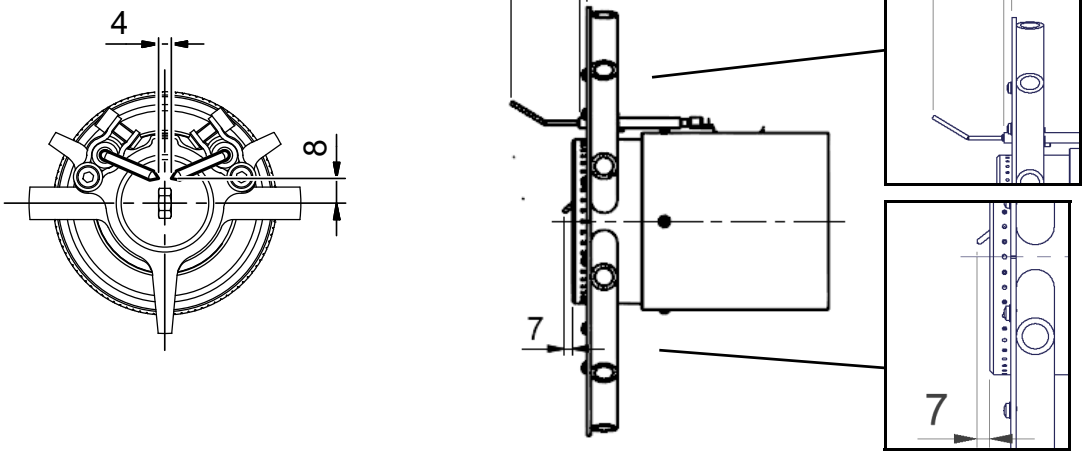
Electrodes Adjustment

Important Note: Check the ignition and detection electrodes after removing/adjusting the combustion head.

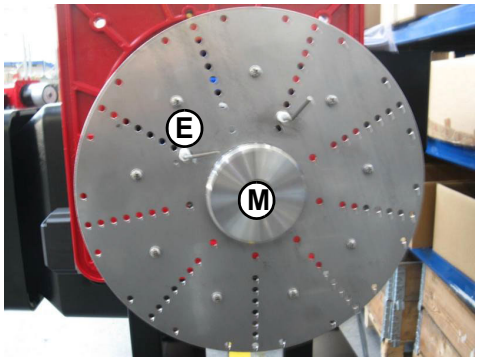
ATTENTION: avoid the ignition and detection electrodes to contact metallic parts (blast tube, head, etc.), otherwise the boiler’s operation would be compromised. Check the electrodes position after any intervention on the combustion head.

adjust the electrodes position according to the electrodes type installed on the burner. follow the quotes shown on the next picture.

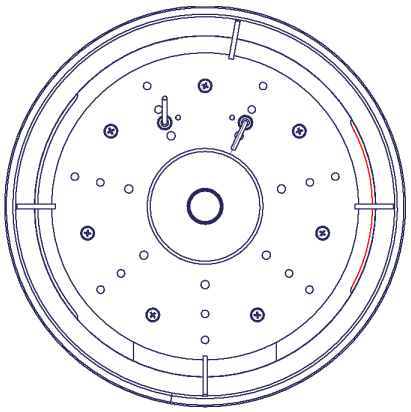
electrodes - type A



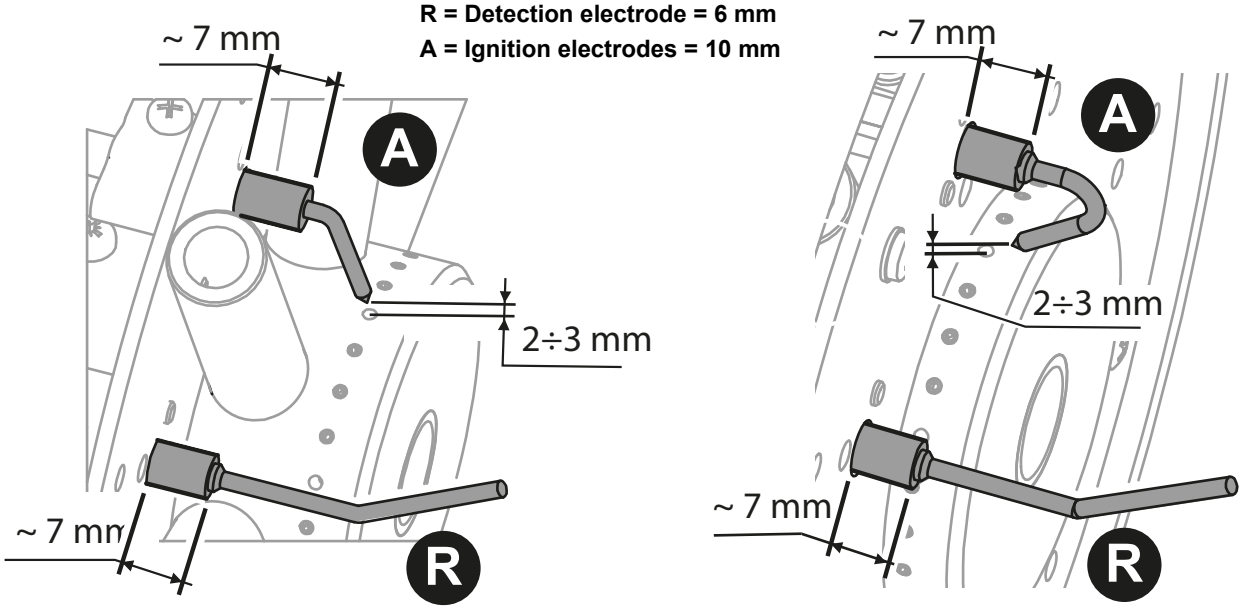
electrodes - type B



electrodes - type C



R = Detection electrode = 6 mm
A = Ignition electrodes = 10 mm



Replacing the ignition electrodes

ATTENTION: avoid the ignition and detection electrodes to contact metallic parts (blast tube, head, etc.), otherwise the boiler's operation would be compromised. Check the electrodes position after any intervention on the combustion head.

electrodes - type A

To replace the ignition electrodes, proceed as follows:

1 remove the burner cover
2 loose the nuts that fasten the electrodes group to the combustion head (A);
3 disconnect the electrodes cables (B);
4 loose the security dowes of the adjusting ring nut (C);
5 shift the electrodes group back to the outside and remove the combustion head (D),
6 loose the screw of th eignition electrodes support (E);
7 remove the electrodes and replace them paying attention to the measures showed in figure (F-G).
8 reassemble the burner by fllowing the procedure in the reversed order.

A



B



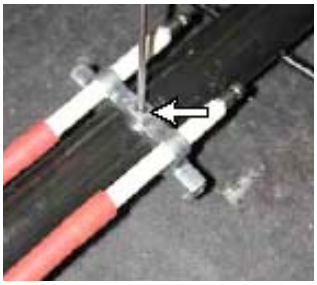
C



D



E



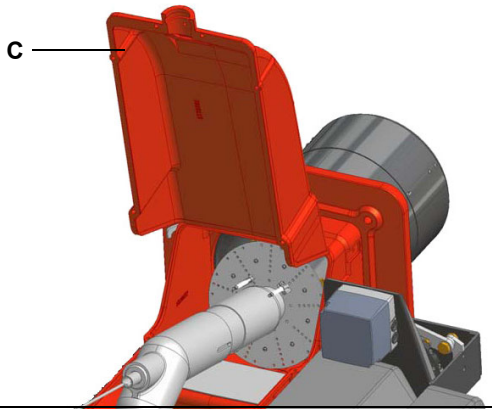
F

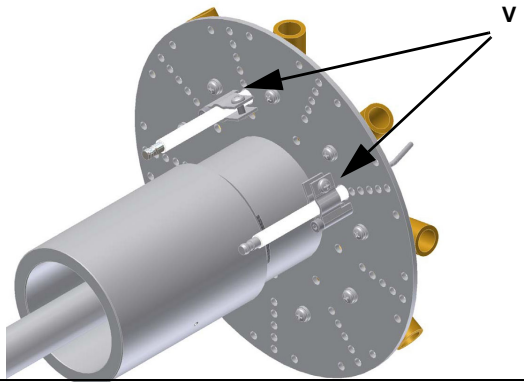


electrodes - type B / C

To replace the electrodes, proceed as follows:

1 remove the burner cover **C;**r
2 disconnect the electrodes cables;
3 emove the combustion head referring to paragraph "Removing the combustion head";
4 unscrew **VE** screws that fasten the electrodes (see next pictures)
5 remove the electrodes and replace them referring to the measures indicated in the previous paragraph;
6 reconnect the electrodes cables;
7 replace the combustion head;
8 replace the burner cover.



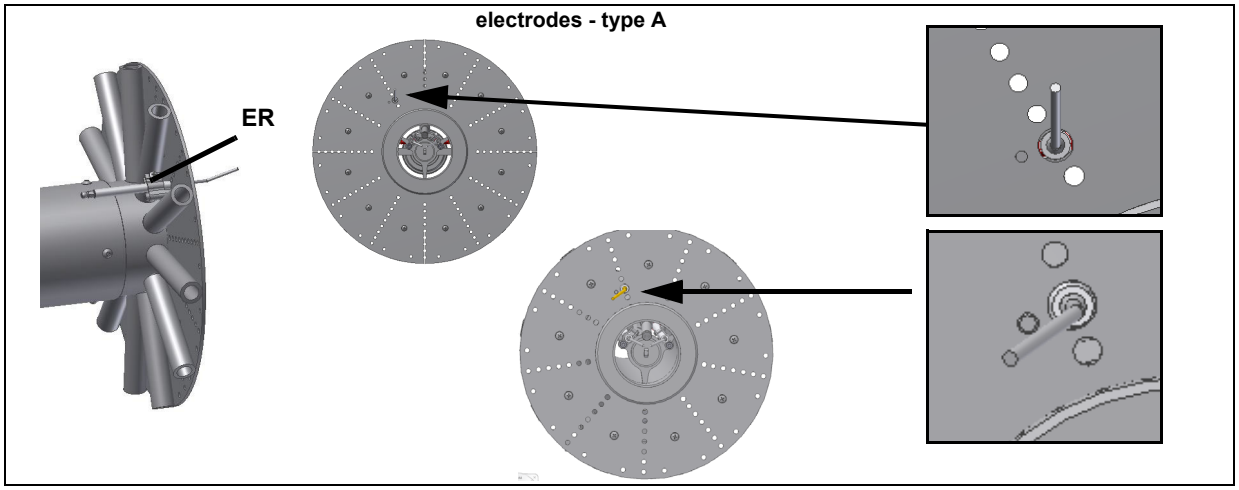


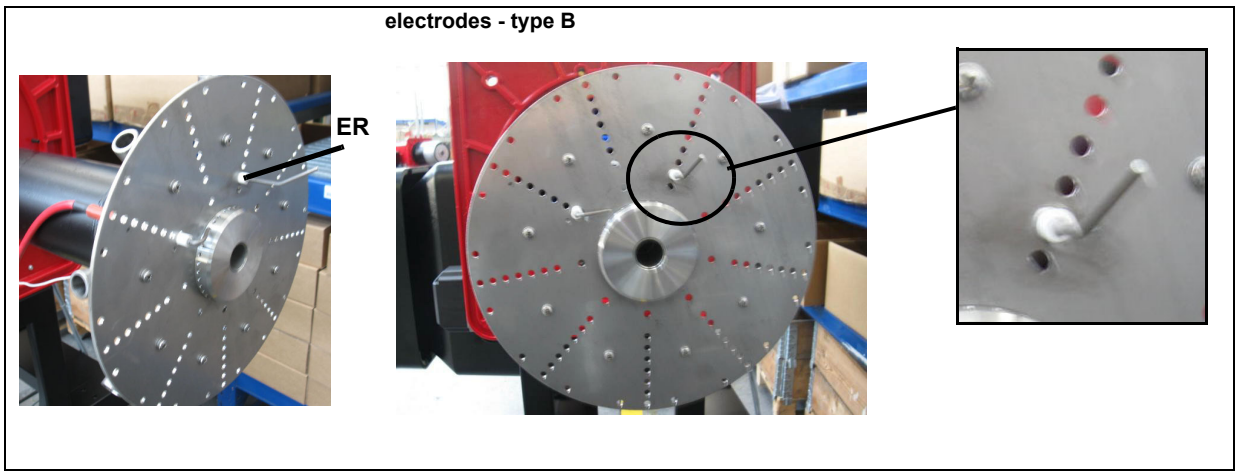
ATTENTION: avoid the electrode to get in touch with metallic parts (blast tube, head, etc.), otherwise the boiler operation would be compromised. Check the electrode position after any intervention on the combustion head.

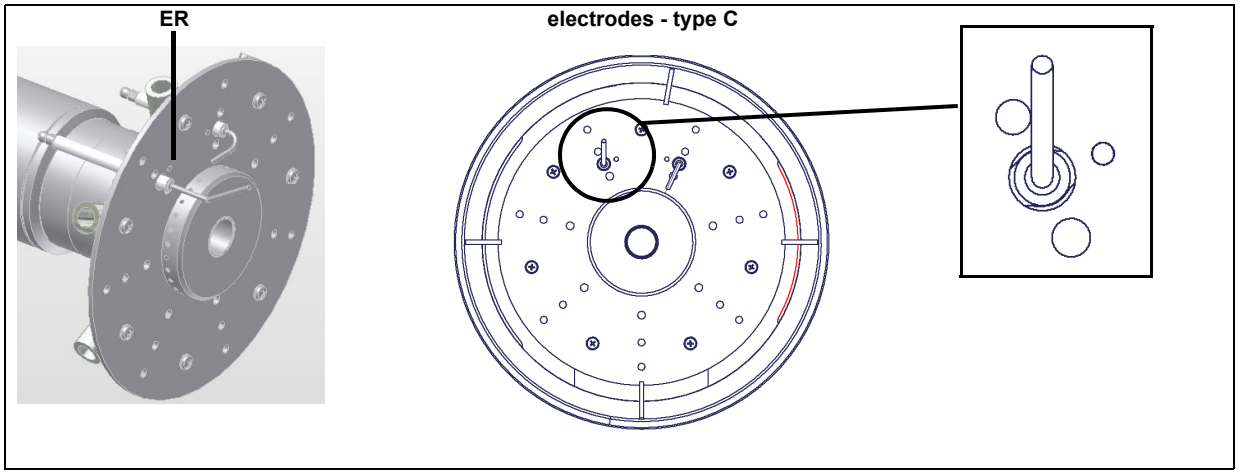
Replacing the detection electrode (natural gas burners)

To replace the detection electrode, proceed as follows:

1 remove the combustion head according to the procedure on paragraph “Removing the combustion head”;
2 by means of an allen key, loose the fixing screws of the detection electrode **ER** and replace it;
3 replace the combustion head.







Burner service term

- In optimal operating conditions, and with preventive maintenance, the burner can last up to 20 years.
- Upon expiry of the burner service term, it is necessary to carry out a technical diagnosis and, if necessary, an overall repair.
- The burner status is considered to be at its limit if it is technically impossible to continue using it due to non-compliance with safety requirements or a decrease in performance.
- The owner makes the decision whether to finish using the burner, or replacing and disposing of it based on the actual state of the appliance and any repair costs.
- The use of the burner for other purposes after the expiry of the terms of use is strictly prohibited.

Seasonal stop

To stop the burner in the seasonal stop, proceed as follows:

1 turn the burner main switch to 0 (Off position)
2 disconnect the power mains
3 close the fuel valve of the supply line

Burner disposal

In case of disposal, follow the instructions according to the laws in force in your country about the “Disposal of materials”.

WIRING DIAGRAMS

Refer to the attached wiring diagrams.

WARNING

1 - Electrical supply 230V / 400V 50Hz 3N a.c.
2 - Do not reverse phase with neutral
3 - Ensure burner is properly earthed

TROUBLESHOOTING GUIDE Gas operation

BURNER DOESN'T LIGHT	* No electric power supply	* Restore power supply
	* Main switch open	* Close switch
	* Thermostats open	* Check set points and thermostat connections
	* Bad thermostat set point or broken thermostat	* Reset or replace the thermostat
	* No gas pressure	* Restore gas pressure
	* Safety devices (manually operated safety thermostat, pressure switches and so on) open	* Restore safety devices; wait till boiler reaches operating temperature then check safety device functionality.
	* Broken fuses	* Replace fuses. Check current absorption
	* Fan thermal contacts open (three phases motors only)	* Reset contacts and check current absorption
	* Burner control lock out	* Reset and check its functionality
	* Burner control damaged	* Replace burner control
GAS LEAKAGE: BURNER LOCKS OUT (NO FLAME)	* Gas flow is too low	* Increase the gas flow * Check gas filter cleanness * Check butterfly valve opening when burner is starting (only Hi-Low flame and progressive)
	* Ignition electrodes discharge to ground because dirty or broken	* Clean or replace electrodes
	* Bad electrodes setting	* Check electrodes position referring to instruction manual
	* Electrical ignition cables damaged	* Replace cables
	* Bad position of cables in the ignition transformer or into the electrodes	* Improve the installation
	* Ignition transformer damaged	* Replace the transformer
BURNER LOCKS OUT WITH FLAME PRESENCE	* Wrong setting of flame detector	* Adjust flame detector
	* Flame detector damaged	* Replace flame detector
	* Bad cables of flame detector	* Check cables
	* Burner control damaged	* Replace burner control
	* Phase and neutral inverted	* Adjust connections
	* Ground missing or damaged	* Check ground continuity
	* Voltage on neutral	* Take off tension on neutral
	* Too small flame (due to not much gas)	* Adjust gas flow * Check gas filter cleanness
	* Too much combustion air	* Adjust air flow rate
only FOR LME22: BURNER CONTINUES TO PERFORM ALL ITS FEATURES WITHOUT IGNITING THE BURNER	* Air pressure switch damaged or bad links	* Check air pressure switch functions and links
	* Burner control damaged	* Replace burner control
BURNER LOCKS OUT WITHOUT ANY GAS FLOW	* Gas valves don't open	* Check voltage on valves; if necessary replace valve or the burner control * Check if the gas pressure is so high that the valve cannot open
	* Gas valves completely closed	* Open valves
	* Pressure governor too closed	* Adjust the pressure governor
	* Butterfly valve closed	* Open the butterfly valve
	* Maximum pressure switch open.	* Check connection and functionality
	* Air pressure switch doesn't close the NO contact	* Check connections * Check pressure switch functionality
THE BURNER IS BLOCKED AND THE EQUIPMENT PROVIDES A LOCK CODE "CAUSE AIR PRESSURE SWITCH FAULT"	* Air pressure switch damaged (it keeps the stand-by position or badly set)	* Check air pressure switch functionality * Reset air pressure switch
	* Air pressure switch connections wrong	* Check connections
	* Air fan damaged	* Replace motor
	* No power supply	* Reset power supply
	* Air damper too closed	* Adjust air damper position
BURNER LOCKS OUT DURING NORMAL RUNNING	* Flame detector circuit interrupted	* Check wiring * Check photocell
	* Burner control damaged	* Replace burner control
	* Maximum gas pressure switch damaged or badly set	* Reset pressure switch or replace it
THE BURNER STARTS AND AFTER A WHILE IT REPEATS THE STARTING CYCLE.	* Gas pressure switch badly set	* Reset the pressure switch
	* Gas filter dirty	* Clean gas filter
	* Gas governor too low or damaged	* Reset or replace the governor
BURNER STANDS WHILE RUNNING WITHOUT ANY SWITCHING OF THERMOSTATS	* Thermal contacts of fan motor open	* Reset contacts and check values * Check current absorption
FAN MOTOR DOESN'T START	* Internal motor wiring broken	* Replace wiring or complete motor
	* Fan motor starter broken	* Replace starter
	* Fuses broken (three phases only)	* Replace fuses and check current absorption
BURNER DOESN'T SWITCH TO HIGH FLAME	* Hi-low flame thermostat badly set or damaged	* Reset or replace thermostat
	* Servomotor cam badly set	* Reset servomotor cam
***mechanical only*: SOMETIMES THE SERVOMOTOR RUNS IN THE WRONG WAY**	* Servomotor capacitor damaged	* Replace capacitor
PHASE-TO-PHASE SUPPLY OR PRESENCE OF VOLTAGE ON NEUTRAL*	* Lights up and freezes	* In such cases, insert an RC circuit (our code 2531003).

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Note: specifications and data subject to change. Errors and omissions excepted.