

POWER BURNERS

VPH, VOH, VKH



The company PBS POWER EQUIPMENT, s.r.o. manufactures, installs and services monoblock and power burners which are employed for burning a wide range of fuels, and which can be used in power and heat production as well as in different technological processes.

USE:

Power industrial burners are produced in versions for gaseous fuels, liquid fuels or as combined burners. The burners are manufactured either in version with a single air box or in version with several burners positioned in a shared air box. They can be used as main power burners, for ignition and stabilization (coal or biomass) or for other special applications.

DATA FOR BURNER DELIVERY:

The design of the burner and its accessories is done by the PBS POWER EQUIPMENT, s.r.o. engineering department. A high quantity of factors regarding the factual consumer, fuel properties, required emissions, and specific requirements for the operation must be taken into consideration. The construction of the burner and its accessories is then designed according to those factors.

DIVISION OF POWER BURNERS:

- According to the fuel:
 - liquid fuel burners
 - gaseous fuel burners
 - combined burners
- According to the use:
 - power (main)
 - ignition and stabilization
 - special
- According to the output:
 - 4 ÷ 80 MW
- According to the design:
 - in a single air box
 - in a shared air box (applies to the arrangement of several burners)

TECHNICAL SPECIFICATIONS:

- Output 4 ÷ 80 MW
- Gaseous and liquid fuels

GASEOUS FUELS:

- Natural gas
- Propane, propane - butane
- Low-heating gases (biogas, degasifying gas, coke gas, blast furnace gas...)

LIQUID FUELS:

- Furnace oil
 - extra light (ELFO, TOLEX, heating oil...)
 - light LFO (light furnace oil)
 - heavy (black oil)
- Combustible refinery products

ADVANTAGES:

- Highly economical operation (low excess of air)
- High reliability and durability
- Safety (automatic checking of leakage of gas fittings and aerating of the appliance prior each start of the burner)
- Combustion of different kinds of gaseous fuel
- Use of modern technologies
- Easy to operate
- Fully automatic operation suitable for unattended control of boiler plants
- Continuous output regulation
- Professional warranty and after-warranty service

STANDARD SCOPE OF SUPPLY:

- Diffuser
- Air box
- Flame monitor
- Gas-electric igniter
- Oil lance with pressure atomizing
- Oil lance with steam atomizing
- Gas inlet
- Burner accessories – closing and regulating fittings stand with the electric box (control and signal elements, terminal block)

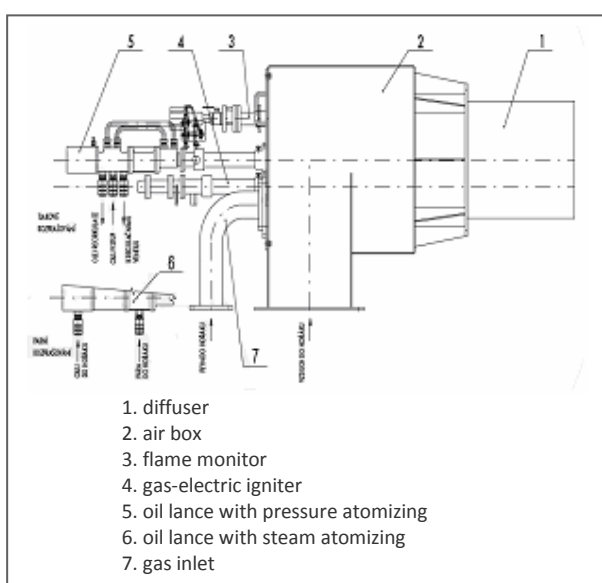


Fig. 1 Standard version of a power burner

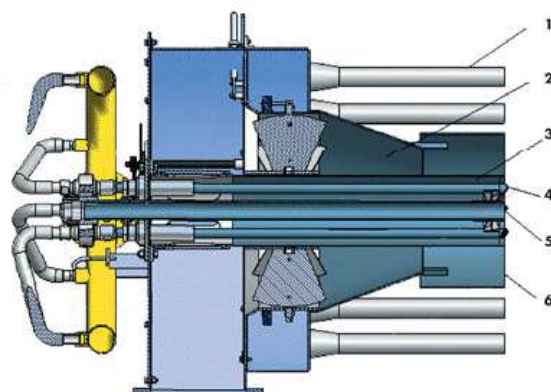
DOCUMENTATION:

Except the common mounting and delivery documentation the statement of conformity with technical requirements according to law No. 22/1997 Coll. and valid governmental regulations is issued.

DATA FOR BURNER DELIVERY:

The design of the burner and its accessories done by the PBS engineering department depends on a high number of factors which must be taken into consideration. Those basic factors are:

- The appliance location (location in terms of legal standards, regulations or ordinances specifying requirements for the operation safety, emission limits etc.)
- The type of the appliance, its technical parameters
- The number and position of burners on the appliance
- The combustion space characteristics (size, geometrical arrangement, pressure ratios)
- The combustion air characteristics (pressure, temperature)
- The fuel properties (composition, calorific power, pressure, cinematic viscosity)
- The method and direction of the air flow, type of the burner box
- The required emissions
- Specific operating conditions and further customer's requirements



1. tertiary air, 2. secondary air, 3. primary air, 4. gas nozzles, 5. oil lance, 6. flue gas recirculation ring

Fig. 2 Burner cross section with air phasing



INLET TECHNICAL PARAMETERS:

Main liquid fuel	extra light (fuel oil), medium and heavy fuel oil, combustible refinery products
Main gaseous fuel	natural gas, degasifying gas, coke gas, blast furnace gas, biogas, waste gases
Combustion air	temperature $20 \div 300$ °C, overpressure compared to the combustion chamber at nominal output $1,6 \div 2,5$ kPa, quantity depending on the burner's output and the type of the fuel
Ignition fuel	natural gas, gaseous phase P-B, resp. coke gas, pressure $5 \div 100$ kPa (short term consumption)
Pressure control air	clean, dry, overpressure 0,6 MPa, quantity max. $2 \text{ Nm}^3/\text{hour}$ (short term consumption)
Electric power	fused supply 3ph 400/230V, 50 Hz for electromotors, 1ph 230V, 50 Hz for the burner's actuators. UPS in case of a requirement for maintaining the operation during a short-time outage of electric power. Power inputs according to the burner output and design, and the fuel parameters.
Atomizing steam	only for oil burners with steam atomizing, overpressure $0,6 \div 1,2$ MPa, slightly overheated
Steam	for heating up of liquid fuel to a viscosity required for optimal atomizing, associated steam to heat up the heavy fuel oil (black oil) piping

OUTLET TECHNICAL PARAMETERS:

Heat output	according to the assignment ranging $4 \div 80$ MW. Burners are supplied in version with the automatic controller where the output is controlled upon the evaluation of required values, e.g. steam pressure, water temperature etc. The control of the fuel-air ratio is secured by the electronic coupling.
Control range	$25 \div 100$ % for gas and oil burners with steam atomizing, $33 \div 100$ % for oil burners with pressure atomizing.
Air excess coefficient	1,05 - 1,1 for the burner nominal output

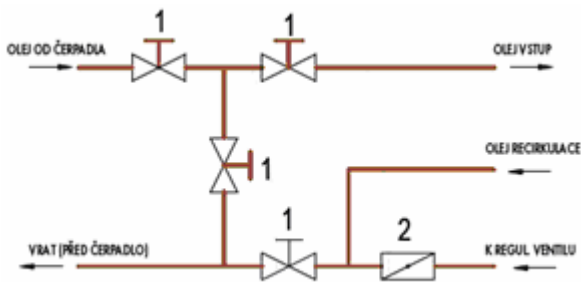


Fig. 3 Power burner



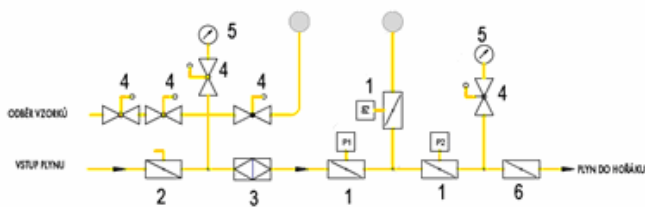
Fig. 4 Low-emission power burner

OIL FITTINGS DIAGRAM DURING PRESSURE ATOMIZING:



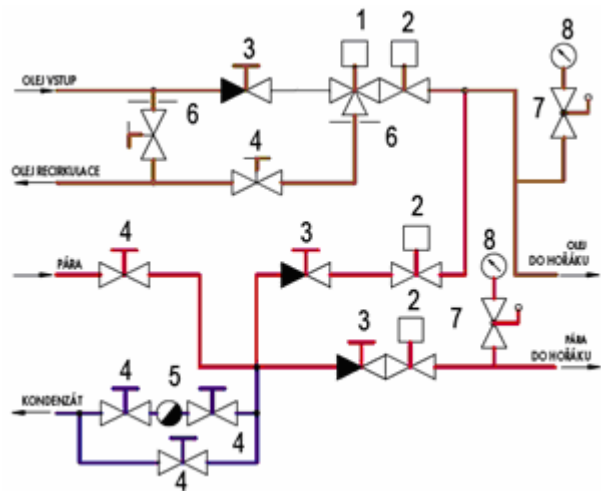
- 1. shut-off valve
- 2. regulation valve

GAS CONNECTION DIAGRAM:



- 1. stop valves with pneumatic drive
- 2. manual shutter valve
- 3. filter
- 4. globe valve
- 5. manometer
- 6. throttle valve

OIL FITTINGS DIAGRAM DURING STEAM ATOMIZING:



- 1. three-way globe valve
- 2. globe valve
- 3. non-return valve
- 4. isolating valve
- 5. steam trap
- 6. orifice
- 7. globe valve
- 8. manometer



Fig. 5 Burner accessories – fittings stand



PBS POWER EQUIPMENT, s.r.o.
 Průmyslová 162
 674 86 Třebíč
 ČESKÁ REPUBLIKA
Tel.: +00420 568 504 320
Fax: +00420 568 504 642
E-mail: kpleha@pbstre.cz
www.pbspe.cz