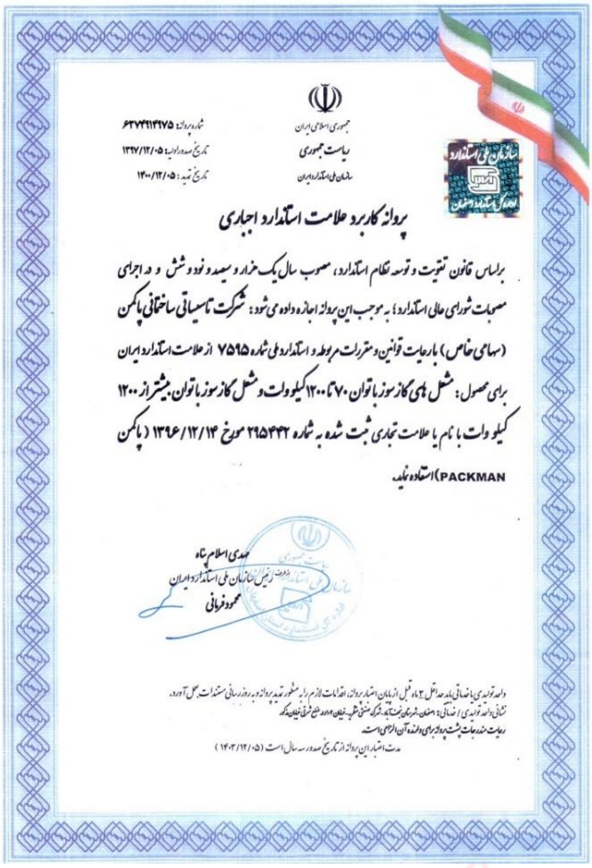
A short introduction of PACKMAN Dual fuel modular burners

RLGB-M Series or RAADMAN Modular triple fuel burners, covering a firing range from 160 to 17000 kW, are designed for a wide range of domestic and industrial applications All RAADMAN modular burners are equipped with LAMTEC, SIEMENS or Auto Flame electronic control system with capability of full air/gas ratio control throughout entire burner operating range. These burners have been tested and evaluated based on Iran national standard ISIRI-7595 (BS-EN 676) and ISIRI-7594 (BS-EN 267) for gas and oil operation respectively. According to performed experiments, the values of CO even in low excess air operation is lower than 30 mg/kWh (In some cases, values close to zero have also been reported). The precise design of combustion head results a full gas-air mixture that guarantees high efficiency levels in all various applications. Burner superior design accompanied by high quality electronic devices have also resulted a further improvement in boiler's performance in order to decrease fuel cost and emissions

RLGPB-M-M-1250 (1200-12000 kW)

RLGPB-M/M-1250 is an electronic Modular triple fuel burner with 1:10 turn down ratio, which is appropriate of different industrial applications. The values of CO and NOx during burner operation are lower than 30 and 120 mg/kWh, respectively. Therefore, the burner's NOx class of II is reported and approved. Compact design, silent operation due to injected absorption material, backward fan wheel and independent actuators are the most considerable advantages for this burner.

Burner Certificate



جمهوری اسلامی ایران
ریاست جمهوری
سازمان ملی استاندارد ایران

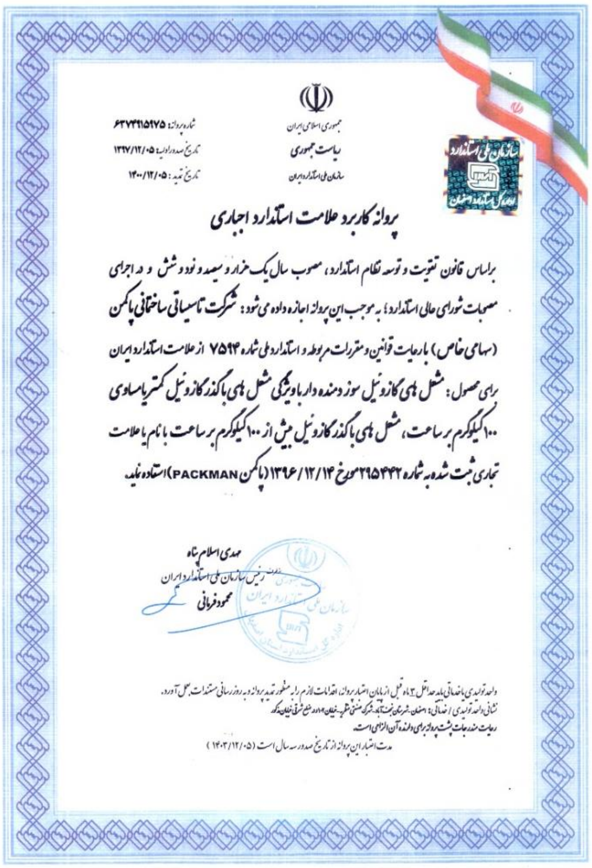
شماره پروانه: ۶۳۷۴۱۱۴۹۷۵
تاریخ صدور اولیه: ۱۳۹۷/۱۲/۰۵
تاریخ تمدید: ۱۴۰۰/۱۲/۰۵

پروانه کاربرد علامت استاندارد اجباری

براساس قانون تقویت و توسعه نظام استاندارد، مصوب سال یک هزار و سیصد و نود و شش و در اجرای مصوبات شورای عالی استاندارد؛ به موجب این پروانه اجازه داده می شود: شرکت تاسیساتی ساختمانی پاکمن (سهامی خاص) بارعایت قوانین و مقررات مربوطه و استاندارد ملی شماره ۷۵۹۵ از علامت استاندارد ایران برای محصول: مشعل های گازسوز با توان ۷۰ تا ۱۲۰۰ کیلووات و مشعل گازسوز با توان بیشتر از ۱۲۰۰ کیلو وات با نام یا علامت تجاری ثبت شده به شماره ۲۹۵۴۴۲ مورخ ۱۳۹۶/۱۲/۱۴ (پاکمن PACKMAN) استفاده نماید.

مهدی اسلام پناه
از طرف رئیس سازمان ملی استاندارد ایران

Figure 1 -Burner certification based on the Iran national standard ISIRI-7595, Equal to the BS-EN 676 international standard



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مهدی اسلام پناه
از طرف رئیس سازمان ملی استاندارد ایران

Figure 2-Burner certification based on Iran national standard ISIRI-7594, Equal to the BS- EN 267 international standard.

General Dimension

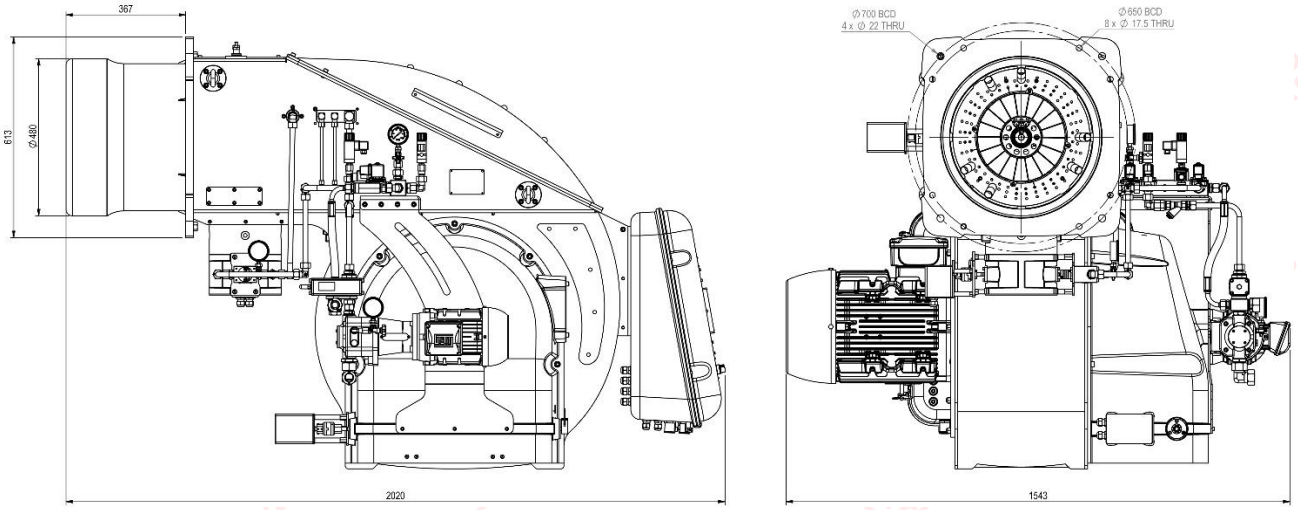

Figure 3 - Burner Dimensions

Firing Rate

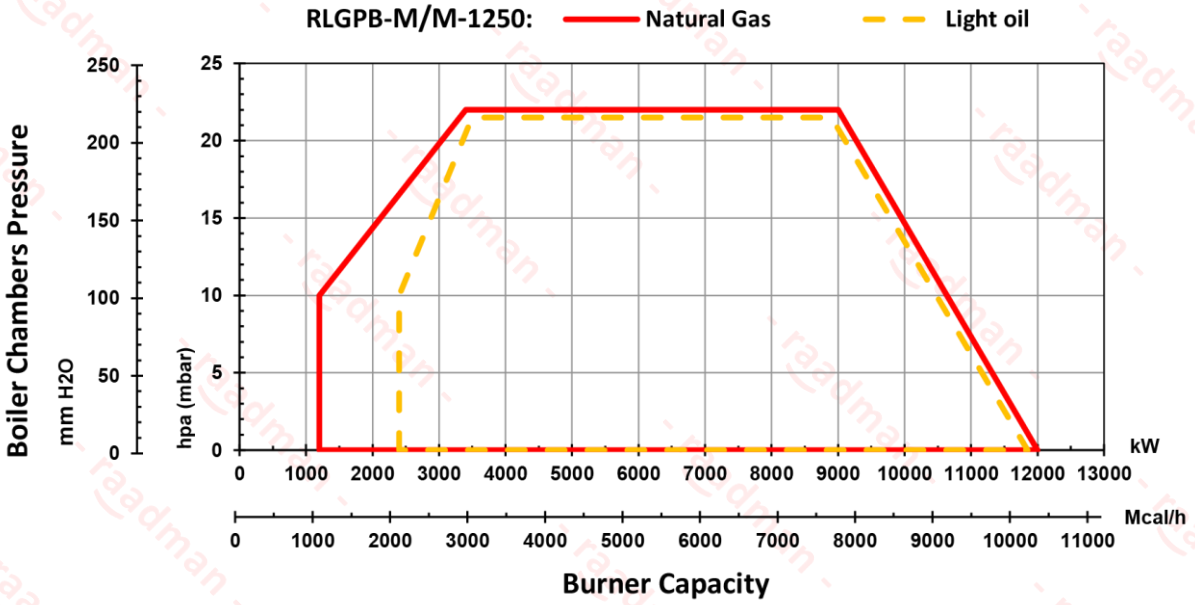

Figure 4 - Burner Firing Diagram

The firing rate diagram has been obtained considering ambient temperature of 20°C and atmospheric pressure of 1013 mbar (Sea level condition) according to the BS-EN 267 & BS-EN 676.

Special note: Turn-down ratio higher than (1:8, 1:9, 1:10, etc.) are accessible for the burner with the head actuator. Otherwise, without a head actuator, the max turn-down ratio is 1:6.

RLGPB-M-M-1250 Technical and Functional Features

- Highly efficient gas burners for domestic and industrial applications.
- Light weight and optimized geometry.
- Compatible with all types of combustion chambers according to EN303 standard.
- Simple Installation, adjustment and maintenance.
- Modular operation
- Ability to work based on Air-Fuel control curve.

- Easy access to internal components
- Rail system for ergonomic servicing of the mixing assembly.
- Engineered for maximize efficiency and fuel cost savings.
- Designed in accordance with 7595 and 7594 Iran national standard (BS-EN 676 , BS-EN676)
- Suitable for single/double hot water/steam boilers plus high capacity multi burner water tube boilers.
- Equipped with high quality and reliable electronic devices.

Table 1 - RLGPB-M-M-1250 Combustion Specification

Item	Description
Fuels:	Natural Gas / LPG / Light oil
Gas capacity**:	1200-12000 kW
LPG capacity:	1200-12000 kW
Oil capacity:	202 - 1012 kg/h
operation:	Electronic modular system
Gas pollution:	II class of NOx according to BS-EN 676
LPG pollution:	II class of NOx according to BS-EN 676
Light oil pollution:	II class of NOx according to BS-EN 676
Certificates: Certificate No:	ISIRI 7595, ISIRI 7594 6374914975, 6374915975
Other abilities:	-Low excess air operation -Ability to run according to the Air/fuel ratio curve -Ability of Communication with external systems via Bus. -Independent ignition point position for safe burner starts -Adjustable pre-purge and post purge time -Absence of joint clearance using linkage less actuators avoiding mechanical hysteresis -Easy commissioning using modular human interface -Parameter's indication -History of errors -Mono-bloc configuration -Silent operation (Due to the injected sound absorbing material) -Including valve proving system -Ability of hinged opening of burner housing in both directions -High turn down ratio for avoiding any shut down in low required loads -Economical price using central burner controllers (With improved technology and ease of use, combustion plant is becoming even more economical as: NO additional burner controller is required, Less installation work with less errors, NO additional cost for valve proving, Taking less time for commissioning and service work) -Optional ability to install a variable speed drive for avoiding any impact in startup -Optional ability of running with O2 and CO sensors. -Optional ability of running with FGR in order to further reduction in NOx level

** Reference conditions: Ambient temperature 20°C - Gas temperature 15°C - Barometric pressure 1013 mbar - Altitude 0 m

Table 2 - Recommended Gas Train

Standard Gas Train: Separated items, DN 100/80, Lower than 500 mbar			
Item	QTY	Specification	Brand*
Multi-block Solenoid Valve	1	MBE-VB-80, Working Pressure, 700 mbar Valve Drive VD-V-AC, Valve Drive VD-R-AC DN80	DUNGS
Pressure transmitter	1	PS-50/200	DUNGS
GF 4100/4	1	Gas Filter, Max operating pressure = 4 bar, DN 100	DUNGS
FRSBV DN25	1	Safety pressure relief, Max operating pressure =1 bar, DN 25	DUNGS
MVD 207/5 (Vent Valve)	1	Solenoid valve, Single stage gas valve, Fast opening fast closing, Max operating pressure=360 mbar, Rp ¾	DUNGS
MVD 207/5 (Safety pilot valve)	1	Solenoid valve, Single stage gas valve, Fast opening fast closing, Max operating pressure=360 mbar, Rp ¾	DUNGS
MVDLE 207/5 (Main pilot valve)	1	Solenoid valve, Single stage gas valve, Slow opening fast closing, Max operating pressure = 360 mbar, Rp ¾	DUNGS
FRS 507	1	Pressure regulator with spring P max=500 mbar, Rp ¾	DUNGS
GW 500 A6	2	Gas pressure switch, Range: 100-500 mbar - with plug	DUNGS
GW 50 A6	1	Gas pressure switch, Range: 5-50 mbar - with plug	
Pressure indicator	1	Range: 0-600 mbar, Rp ½	
Pressure indicator	1	Range: 0-250 mbar, Rp ½	
Collector 1	1	DN 100 - DN 80	
Collector 2	1	DN 80 - DN 100	

* Though these brands are common in this type of burner, they would may change based on available components in the market (such as MADAS, SIEMENS, etc.) or according to the policy of Packman Co.

Table 3 - Burner Equipment and Accessories

Power System		
Item	Specification	Brand*
Main motor	37 kW, 3 Phase, B5, 380-400 Volt, 50 Hz, 2900 rpm	WEG, ITALMOTORS, ABB
Bi-metal	LR2D3354	SCHNEIDER
Contactor	LC1D80, LC1D65	SCHNEIDER
Selector switches	XB4 BD21	SCHNEIDER
Star-Delta Timing Relay	RE22R1QCMU	SCHNEIDER
Burner Management System		
Item	Specification	Brand*
LMV 51 (Main controller)	With 4 tree-state-step-output	SIEMENS
Manual interface	AZL5…	SIEMENS
Air actuator	Servomotor 20 N.M SQM 48..	SIEMENS
Fuel actuator	Servomotor 20 N.M SQM 48..	SIEMENS
Flame scanner	QRI2B2.B180B1	SIEMENS
Transformer	AGG 5.220	SIEMENS

There is no priority in choosing the control system and it is possible to change the control system based on the inventory and customer request.

Oil delivery system		
Main motor	2.2 kW, B34, 380-400 Volt, 50 Hz, 2840 rpm	ITALMOTORS, ABB
Bi-metal	LRD10	SCHNEIDER
Contactor	LC1D12M7	SCHNEIDER
Pump	T3C 107 accompanied by TV 4001-1 pressure adjuster	SUNTEC
solenoid valve (Main and safety on feed and return line)	Pressure 0.5-40 bar Flow factor >1.9 m3/h	GEVAX
Normally open solenoid valve for needle opening	EV1 5P/13 Pressure 0.5-16 bar	GEVAX
Max oil pressure switch	DSB 146 F001 Operating pressure= 0-10 bar, Working temperature= up to 70 C	SAUTTER
Min oil pressure switch	DSB 170 F001 Operating pressure= 5-40 bar, Working temperature= up to 70 C	SAUTTER
Oil regulator	Code: S70-VK1/2	FLUIDAL

Oil delivery system		
Oil Nozzle	Industrial fly back oil Nozzle With Needle Type: C Angle 60˚ Output: 1050 kg/hr	BERGONZO
Feed line pressure gauge	0-100 bar	
Return line pressure gauge	0-60 bar	
Ignition System		
Item	Specification	Brand*
Transformer	Tra.f.an- Single wire	TRAFO
Gas pilot	Appropriate for 1250 series	PACKMAN CO
Oil transformer	Tra.f.an- cof 2 wire	TRAFO
Other Components		
Item	Specification	Brand*
Air pressure switch (Min switch)	LGW 10 A2 , 1-10 mbar	DUNGS
Boiler chamber pressure switch (Max switch)	LGW 50 A2 , 2.5-50 mbar	DUNGS

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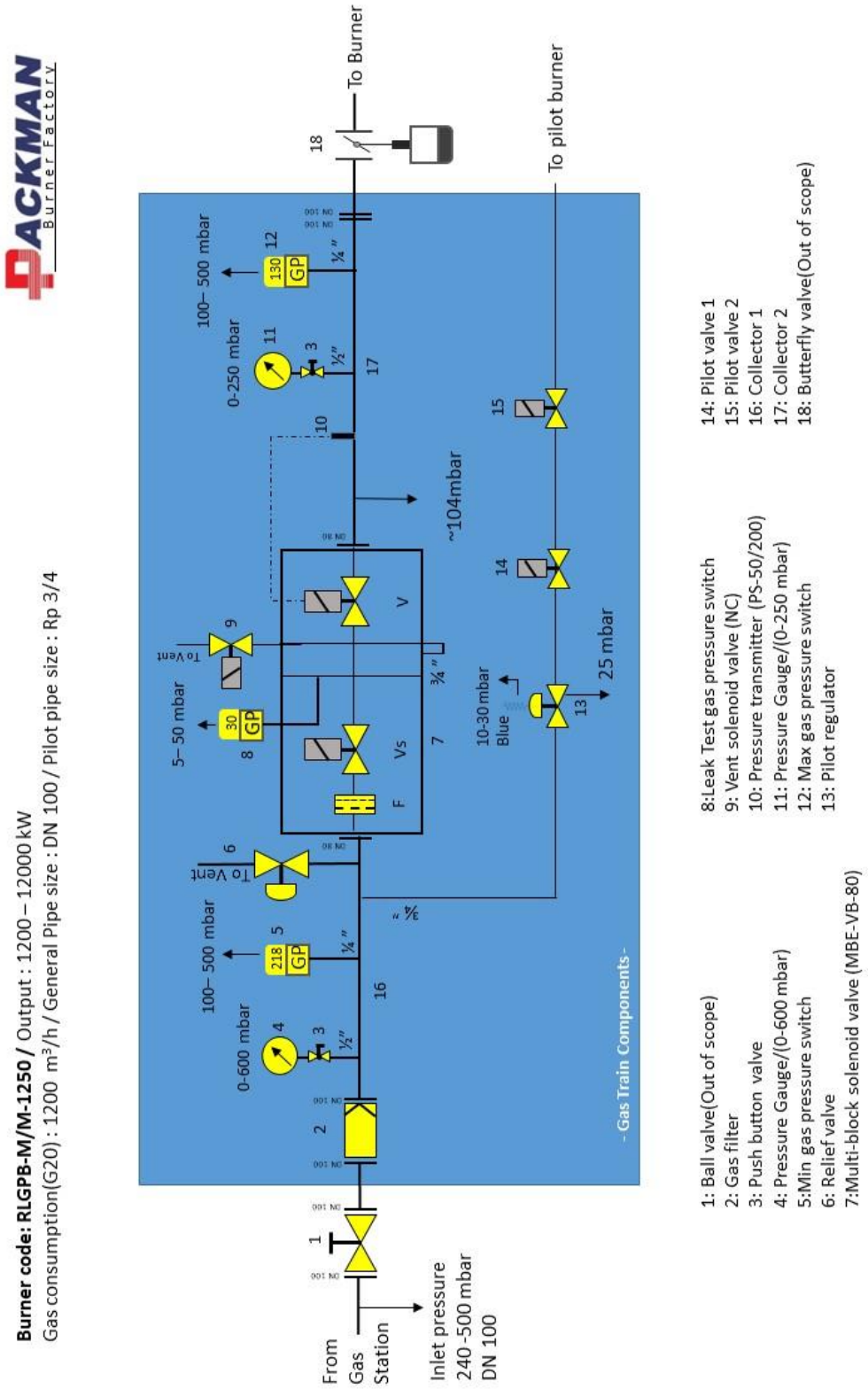

Figure 5 - Standard Gas Train, DN 100, 360 mbar

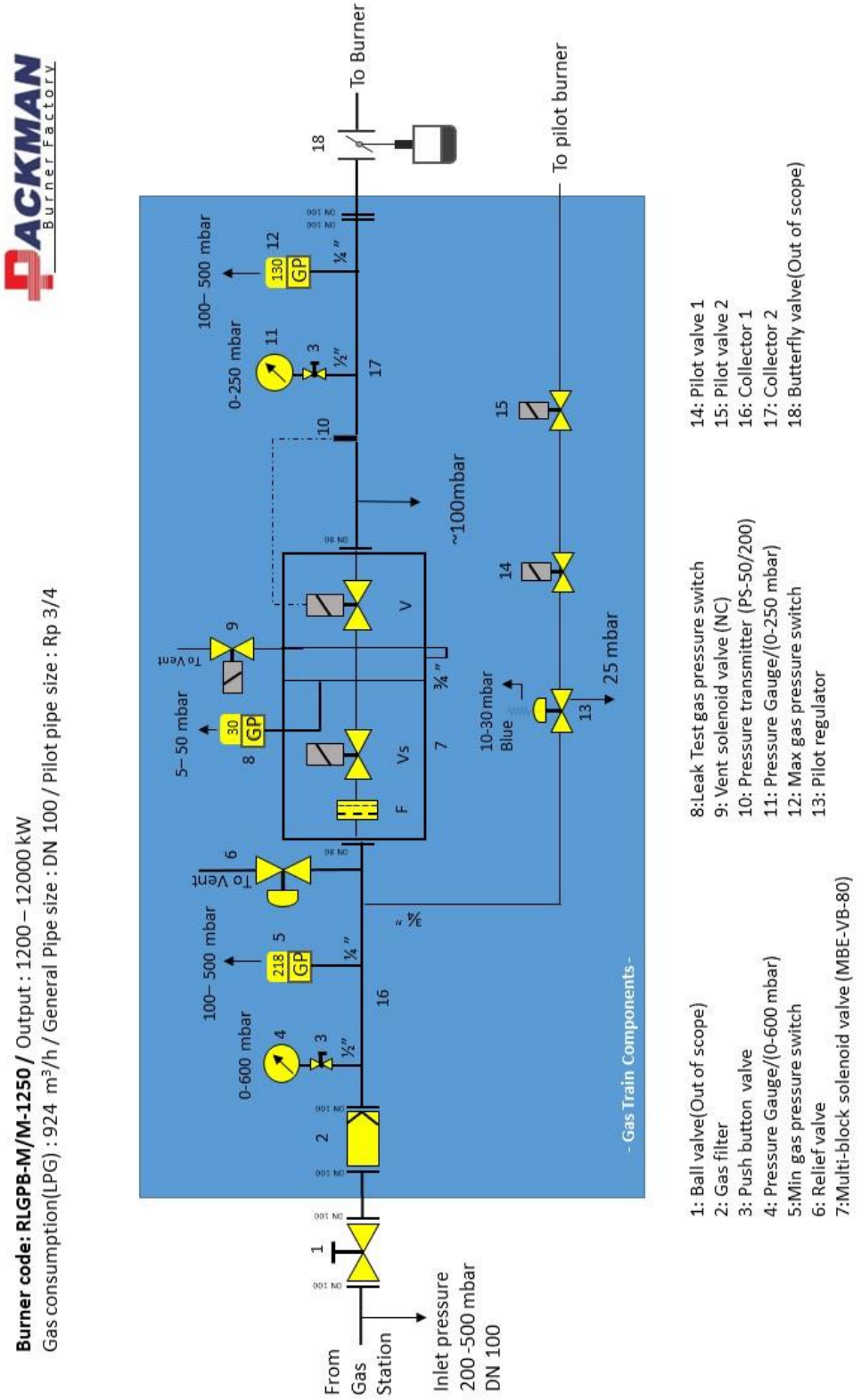

Figure 6 - Standard Gas Train, DN 100, 360 mbar