

# VALUPAK-II, low temperature burners



#### CONTENTS

# **OPERATING INSTRUCTIONS**

· Edition 11.22 · 32-00270 · EN

#### **1 SAFETY**

#### 1.1 Please read and keep in a safe place

Please read through these instructions carefully before installing or operating. Following the installation, pass the instructions on to the operator. This unit must be installed and commissioned in accordance with the regulations and standards in force. These instructions can also be found at www.docuthek.com.

#### 1.2 Explanation of symbols

**1**, **2**, **3**, **a**, **b**, **c** = Action

 $\rightarrow$  = Instruction

#### 1.3 Liability

We will not be held liable for damage resulting from non-observance of the instructions and non-compliant use.

#### 1.4 Safety instructions

Information that is relevant for safety is indicated in the instructions as follows:

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Indicates potentially fatal situations.

# 

Indicates possible danger to life and limb.

# **A**CAUTION

Indicates possible material damage.

All interventions may only be carried out by qualified gas technicians. Electrical interventions may only be carried out by qualified electricians.

#### 1.5 Conversion, spare parts

All technical changes are prohibited. Only use OEM spare parts.

#### 1.6 Instructions provided by the company

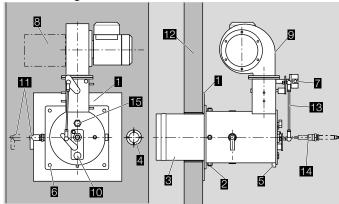
Instructions provided by the company or individual responsible for the manufacture and/or overall installation of a complete system incorporating MAXON burners take precedence over the installation and operating instructions provided by MAXON. If any of the instructions provided by MAXON are in conflict with local codes or regulations, please contact MAXON before initial start-up of equipment.

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# 2 CHECKING THE USAGE

The VALUPAK-II is designed for process air heating applications. This function is only guaranteed when used within the specified limits – see page 5 (10 Technical data). Any other use is considered as non-compliant.

#### 2.1 Part designations



- 1 Stiffener plate
- 2 Lock screw (mixing cone)
- 3 Discharge sleeve
- 4 Viewing port
- 5 Additional burner support
- 6 Stud bolt
- 7 Air pressure switch (option)
- 8 Air filter (option)
- 9 Air supply
- 10 Fuel supply
- 11 Space required for spark ignitor removal
- 12 Oven wall
- 13 Air-Gas linkage (Control motor (option))
- 14 Space required for flame rod/scanner removal
- 15 Sight glas

# **3 APPLICATION REQUIREMENTS**

#### 3.1 Viewing port

→ A view port to observe burner flame is essential to inspect the flame aspect. Locate the view port downstream of the flame, looking back to the burner block. Make sure the complete flame can be evaluated.

#### 3.2 Required ancillary equipment

→ Ensure that all ancillary equipment for safe operation and correct performance of the VALUPAK-II burner is installed, as described in the applicable local codes and/or process-related instructions. An accurate control of the air/gas ratio is essential for optimal performance of the burner.

#### 3.3 Supporting burner air and gas piping

→ The VALUPAK-II burner shall not be used as support for the piping to the burner. Gas and air piping shall be supported in such way that no additional loads will be created on the burner.

#### 3.4 Burner mounting flange loads

→ Check burner weight and reinforce burner mounting flange or combustion chamber/furnace back wall if necessary to take the complete burner weight.

# **4 INSTALLATION**

#### 4.1 Handling of VALUPAK-II burners

→ VALUPAK-II burners are shipped as complete units. Handle burners with care, using proper equipment during unpacking, transport, lifting and installation.

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Any impact on the burner could result in damage.

To prevent damage in transit spark ignitor and linkage (if any) are shipped "loose".

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- Installer must comply with all applicable codes and standards.
- Observe required space for parts removal.

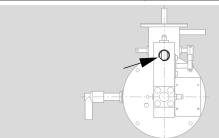
#### 4.2 Installation position

Burner may be mounted in any position suitable for automatic control motor and UV scanner.

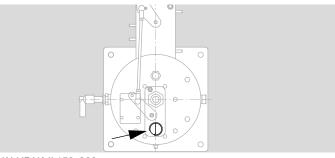
#### 4.3 Gas inlet connection

Gas connections are NPT = allowed in Europe, mandatory in USA and Canada.

VALUPAK-II	Gas inlet
60	1/2" NPT
150	3/4" NPT
300, 600, 900	1" NPT



VALUPAK-II 60





#### 4.4 Flame supervision

Both flame supervision, flame rod and UV scanner, can be used for VP-II-150–900. Please note the following requirements.

#### VP-II-60

A reliable flame signal can only be obtained with a flame rod. The flame signal by UV scanner is too weak especially in the lower capacity ranges.

#### VP-II-150-900

To get a reliable flame signal a small amount of purge air is recommended (0,5–1  $\rm m^{3}/hr).$ 

#### **VP-II-900**

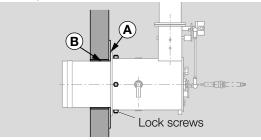
A flame rod can only be used on natural gas firing. On LPG firing there is a risk for soot formation on the rod. For LPG firing only a UV-scanner can be used.

The recommended adjusting dimension for the flame rod arrangement shall be respected.

#### 4.5 Burner mounting

Burner will typically be installed through an oven wall or insulated air duct. Cut opening at least 25 mm larger in diameter than discharge sleeve to allow for sleeve expansion.

Additional burner support may be required in conjunction with a stiffener plate to support burner package weight (20-25 kg). Four 13 mm diameter holes into panels flange accept 10 mm stud bolts welded to panels or stiffener.



# A CAUTION

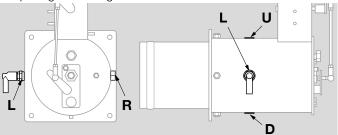
Seal welding of burner flange to stiffener plate at (A) may cause warpage of burner flange and require additional seal material to prevent leakage.

- → For push-through systems, area A should be sealed with additional gasketing or high temperature packing, to prevent back flow of high temperature air.
- 1 Fill area B with no more than 50 mm of high temperature packing (too little will overheat mounting, too much will overheat sleeve).
- → For pull-through systems, spacers may be installed on stud bolts and area **B** left empty to permit cooling air past the sleeve.
- → Four lock screws permit centering mixing cone within burner body and sleeve.
- **2** They should be drawn up handtight, then backed out 180° to allow for cone expansion.
- **3** They must be rechecked after start-up and loosened if necessary to prevent deformation of cone, see page 4 (7.1 To start-up a VALUPAK-II burner for the first time). instruction for details. Tightening can lead to cone distortion and greatly reduced cone and discharge sleeve life.
- → Discharge sleeve must be flush with, or extended beyond interior wall.
- **4** A viewing port should be provided for flame observation in such a position that burner flame can be fully seen.

#### 4.6 Flame rod or UV scanner arrangement with spark ignitor 4.6.1 Spark ignitor orientation

The spark igniter can be mounted in 4 different positions on the burner housing (seen from the back of the burner): left (standard position), right, up (blower side) and bottom (if the air inlet is on top). VP-II-60 has only 3 different positions. There's no up connection (to the blower side), only left, right and bottom/down.

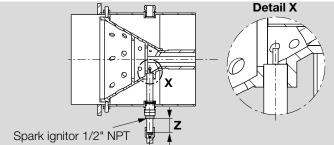
All spark ignitor arrangements = 1/2" NPT connection.



VP-II-60-900

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4.6.2 Spark ignitor arrangement



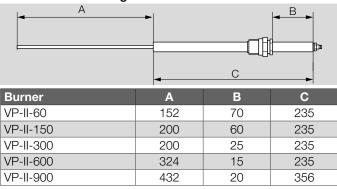
Burner	Z
VP-II-60	44
VP-II-150	15
VP-II-300	33
VP-II-600	27
VP-II-900	14

#### 4.6.3 Spark ignitor replacement

**1** First loosen the ignitor from the 1/2" bushing.

- **2** Turn the 1/2" bushing in the main housing.
- **3** Put the ignitor thru the bushing.
- 4 Put the ignitor thru the ignitor hole in the mixing cone until the mechanical stop (see detail X).
- **5** Tighten the ignitor in the 1/2" bushing.

#### 4.6.4 Flame rod arrangement



- → The flame rod is located at the back of the burner, through the scanner tube.
- → It is important that the flame rod is mounted gastight!
- $\rightarrow$  The recommended adjusting dimension shall be respected.

# **5 START**

- 1 Make sure trip release shut-off valve and main gas cock are all closed.
- 2 Make sure the burner firing rate control handle is at predetermined low fire "LO" position.
- **3** Start all circulating and exhaust fans.
- 4 Energize system control panel (if applicable).
- **5** Start burner blower motor.
- 6 Open main gas cock.
- 7 Press start button.
- 8 Main gas valve will open (only if all safety circuits are complete).

## 6 STOP

- 1 Push STOP button.
- 2 Main gas valve should automatically close.
- **3** De-energize system control panel and burner blower motor. 4 Close main gas cock.

## 7 COMMISSIONING

#### A CAUTION

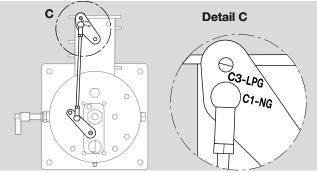
Incorrect start up and ajustment!

Please observe the following to ensure that no damage occurs:

- Before initiating the following start-up and adjustment procedure, it is important that a check be made to verify that all of the equipment associated with and necessary to the safe operating of the VALUPAK-II burner system has been installed and piped in accordance with the general installation instructions.
- If the burner system is part of an oven or other heating unit which has been purchased as a complete prepiped and pre-wired package, it may be assumed that these instructions have already been carried out by the individual or company responsible for the overall installation.
- → Initial adjustment and light-off should be undertaken only by trained and experienced personnel familiar with combustion systems, with control/safety circuitry and with knowledge of the overall installation.

#### 7.1 To start-up a VALUPAK-II burner for the first time

- 1 Close main gas cock.
- **2** Check tightness of gas piping.
- **3** Connect U-tube manometer to burner test connection on the burner gas nozzle inlet.
- **4** Note burner type and required gas pressure, see page 5 (10 Technical data).
- **5** Establish correct blower direction of rotation of all fans. See arrow on blower housings.
- 6 Disconnect automatic control motor wiring to avoid unexpected motor travel.
- 7 Check that gas control valve is at low fire position (as supplied): For size 150, 300, 600 and 900 control motor rotation is counter clockwise when looking towards controls linkage going from low to high fire. For the size 60 when looking to the linkage the air butterfly crank rotation is counterclockwise. Since the control motor is located at the opposite side of the linkage its rotation is clockwise from low to high fire.
- → When operating the burner with LPG instead of natural gas, the linkage connection on the air valve crank needs to be changed.
- 8 In order to do this, unscrew the nut (M6) at the back of the crank and relocate the linkage from the hole marked "C1–NG" to the hole "C3–LPG" by slightly rotating the crank and linkage.
- 9 Screw the nut back in place. No further modification on the burner needs to be done.



#### **10**Bleed air from the fuel supply line.

- **11** Remove the cover from the gas pressure regulator and establish that regulator is at low end of control range.
- **12**Check the adjustments of the flame rod, spark ignitor and/or pilot, see page 3 (4.6.2 Spark ignitor arrangement).
- 13 Start all machine air blowers.
- **14**Start burner with its start-stop switch. Motor of combustion air fan will be started shortly after, by means of the burner flame safeguard programming relay.
- **15**Purge the combustion chamber, purging any explosive vapors that may have accumulated prior to the start.
- → The length of purge time required will usually be specified by insurance or approval agency having jurisdiction and depends on the total amount of fresh air and the volume of combustion space.

- → A 5-fold refresh rate should be minimum. At the end of the purge time of the burner flame safeguard programming relay ignition is energized and the main gas valve will be energized shortly after.
- → Because main gas cock is closed the programmer will lock out requiring manual reset. Operation of programmer is correct.
- **16**Check setting of low and high gas pressure switches and combustion air pressure switch.

**17**Check burner control valve at LO position.

**18**Slowly open main gas cock.

- **19**Reset burner relay and start burner.
- → After the burner flame safeguard programmer relay prepurge time ignition is energized and main gas valve opened. Flame should be established within safety time of programmer.
- → If again flame failure, air could still be in gas supply line just before burner.

**20**Reset programmer and restart until low fire flame is established.

- **21** Check gas supply pressure with information on page 5 (10 Technical data) and correct with adjusting screw of gas pressure regulator.
- **22**In the case of LPG firing, multiply the referenced natural gas pressures by 0.4 to arrive at optimal LPG pressures.
- **23**Observe flame through observation port at rear of burner.
- **24**Slowly bring burner to high fire position and avoid maximum temperature of dryer.
- **25** Close cover on pressure regulator and adjust all pressure switches. High gas pressure switch at low fire. Low gas pressure switch at high fire.
- **26** Close cover on pressure regulator and adjust all pressure switches. High gas pressure switch at low fire. Low gas pressure switch at high fire.
- 27 Air pressure switch at high fire by closing of air inlet until flame color start to change. Burner should trip by air pressure switch.
- **28** Reconnect control motor wiring, start burner and change several times between low and high fire position by changing temperature controller settings.
- **29**Check all other safety devices such as pressure switches, high temperature limits etc. and adjust these devices to their correct values.

#### 8 VALUPAK PACKAGE AND BACK PRESSURE

#### 8.1 Stable back pressure

Burner capacity will depend on back-pressure.

VP-II-150–900: The standard package can be used with stable back pressure between -2.0 and +2.0 mbar except for VP-II-60. VP-II-60: See the table below.

Back-pressure	Capacities kW (HHV)						
	VP-II-60 UHC102		VP-II-60 UHC122		VP-II-60 UMI300		
	min.	max.	min.	max.	min.	max.	
< 2 mbar	not possible						
2 mbar	not possible		not possible		3	65	
1 mbar	2	25	2	50	3	75	
0 mbar	2	40	2	60	3	80	
- 1 mbar	3	45	3	65	4	90	
- 2 mbar	3	50	4	70	5	100	
< - 2 mbar	Not advised, please contact HTS sales or customer contact.						

Once set for a specific back pressure:

- The package can fire stable on lower back pressures, but (min and max) capacity will increase, excess air will increase and higher  $\text{CO/C}_x\text{H}_y$  could be the result.
- The package cannot be used on higher back pressures: this would result in reduced air factor, possible below 1.0 (with longer flames, incomplete combustion etc.).

#### 8.2 Variable back pressures

The burner can still be used but must be commissioned at highest possible back pressure.

- Reducing the back pressure will result in leaner gas/air ratio, combustion will still be reliable but with increased CO and  $C_xH_v$ . But still stable, reliable and safe combustion.
- Increasing the back pressure (after commissioning) will result in excess.

#### 8.3 Maximum/Minimum back pressure

Valupak burners are not intended to fire on high back pressure equipment – the burners have a mounting flange that is not capable of leak free closing the process connection at high back pressure conditions. For processes that require leak tight burner mounting at higher back pressures, other burners shall be used.

For underpressure applications, this does not apply if it is allowed to leak ambient air in the process.

#### 9 MAINTENANCE

#### Safety requirements

- → Regular inspection, testing and recalibration of combustion equipment according to the installation's manual are an integral part of its safety.
- → Inspection activities and frequencies shall be carried out as specified in the installation's manual.
- → Perform the following activities at least annually as part of a recommended preventative maintenance routine:
- 1 Inspect burner internal parts for wear and oxidation, paying special attention to the refractory of the burner block (when applicable).
- **2** Inspect associated control instruments and devices for function with particular attention to all safety permissive switches.
- **3** Perform leak tests on fuel shut off valves according to any schedule established by the authority having jurisdiction.

#### **Visual inspections**

→ Regular visual inspection of all connections (air and gas piping to the burner, bolting of the burner mounting flange) and burner flame shape and aspect are essential for safe operation.

#### **10 TECHNICAL DATA**

Installation position: Burner may be mounted in any position suitable for automatic control motor and UV scanner.

Fuels: Natural gas and propane

Protection: IP 54

Burner package weight: 20–25 kg Standard color is RAL 9006 (White aluminum)

#### 10.1 VP-II burner specification, 60 Hz

Capacity and selection data in kW, 60 Hz operation. Gross heating value =  $10.9 \text{ kWh/m}^3$  (st), d = 0,6 All figures are for balanced - 0 mbar - duct pressure<sup>1</sup>)

		VP-II-	60 <sup>2)</sup>			VP-II-150 <sup>2)</sup>	
Blower	UHC102	UHC	122 UI	MI300	UHC122	UMI300 <sup>4)</sup>	EB <sup>3)</sup>
							20 mbar
Maximum heat release <sup>5)</sup> [kW] (HHV)	40	60		80	222	270	417
Minimum heat release [kW] (HHV)	2			3	6	6	9
Pilot capacity (typical) [kW] (HHV)	00.1	NA		27.1	32	38	59
$Turndown^{1}$	20:1	30:		27:1	37:1	45:1	44:1
Q gas <sub>max.</sub> [m <sup>3</sup> /h(st)]	3.7	5.5		7.3	21.5	26.1	40.4
Q gas <sub>min.</sub> $[m^3/h(st)]$	0.18	0.18		0.28	0,6	0,6	0,9
$Q \text{ air } \max_{\text{max.}} [m^3/h(st)]$	48	64		98	248	301	465
Q air <sub>min.</sub> [m³/h(st)]	4 4 7	NA		4 4 7	64	73	116
Excess air at max. (n)	1.17	1.1		1.17	1.2	1.2	1.2
Excess air at min. (n)				11.4	13.1	13.2	
Flame length at max. capacity (open air) <sup>6)</sup> [m]		up to 0.4 (after sleeve)			1	1.2	1.8
Δp gas max. at burner inlet [mbar]	6.7	11.	5	24	20.5	30.2	71.5
Δp gas max. at burner test connection (typical) [mbar]	5.4	9		18	14.2	21.2	50.3
Δp gas max.at pilot connection [mbar]		NA			27	39	93
Air diff. pressure at test connection				<u> </u>	0.7	0.0	15.0
at maximum heat release [mbar]	2	3.3		6.3	3.7	6.3	15.2
at minimum heat release [mbar]	0.4	0.5		0.6	-	-	-
CO turn down, typical (ref. 100 mg/m <sup>3</sup> at 17% O <sub>2</sub> )		NA			30:1	22:1	4:1
Torque gas-air linkage [Nm]		NA			0.3	0.3	0.5
Lp at 1 m blower, max. capacity <sup>7</sup> ) [dB(A)]		NA			90	90	-
Lw at max. capacity <sup>7</sup> ) [dB(A)]		NA		1.0	98	98	-
Weight [kg]	13	14.2		18	20	24.2	15
Blower motor [kW]	0.09	0.09	9 (	0.25	0.09	0.29	0.55
Burner	VP	-II-300 <sup>2)</sup>	===0	VF	P-II-600	VP-II-900	
Blower	UMI300 <sup>4)</sup>	JMI390	EB <sup>3)</sup> 20 mbar	UHC18	2 <sup>2)</sup> UHC20	2 UHC1822	<sup>()</sup> UHC202
Maximum heat release <sup>5)</sup> [kW] (HHV)	348	432	633	670	761	1060	1272
Minimum heat release [kW] (HHV)	6	10	12.6	15	15	15	15
Pilot capacity (typical) [kW] (HHV)	28	35	51	44	50	49	59
Turndown <sup>1)</sup>	58:1	43:1	50:1	45:1	51:1	71:1	85:1
Q gas <sub>max.</sub> [m <sup>3</sup> /h(st)]	33.7	41.8	61.3	64.8	73.6	102.6	123.1
Q gas <sub>min.</sub> [m³/h(st)]	0.6	1.0	1.2	1.5	1.5	1.5	1.5
Q air <sub>max.</sub> [m <sup>3</sup> /h(st)]	388	482	706	747	848	1133	1418
Q air <sub>min.</sub> [m <sup>3</sup> /h(st)]	64	82	117	148	209	230	276
Excess air at max. (n)	1.2	1.2	1.2	1.2	1.2	1.15	1.2
Excess air at min. (n)	11.4	8.8	10	10.6	15	16.5	19.8
Flame length at max. capacity (open air) <sup>6)</sup> [m]	1.5	1.7	2.3	1.9	2.3	2.2	2.3
Δp gas max. at burner inlet [mbar]	15.5	21.6	46.7	23.4	29.9	33.9	48.8
	7.2	10.9	23.5	14.7	18.5	7.4	10.7
$\Delta p$ gas max. at burner test connection (typical) [mbar]	25	39	83	25	33	51	74
Δp gas max. at burner test connection (typical) [mbar] Δp gas max.at pilot connection [mbar]							
					1/	0.4	12.2
Δp gas max.at pilot connection [mbar]	5.3	8.6	18.5	9.9	14	8.4	12.2
Δp gas max.at pilot connection [mbar] Air diff. pressure at test connection	5.3	8.6 -	18.5 -	9.9 0.6	0.9	0.5	0.7
Δp gas max.at pilot connection [mbar] Air diff. pressure at test connection at maximum heat release [mbar]	5.3 - 25:1	8.6 - 20:1	18.5 - 17:1	-			
Δp gas max.at pilot connection [mbar] Air diff. pressure at test connection at maximum heat release [mbar] at minimum heat release [mbar]	-	-	-	0.6	0.9	0.5	0.7
Δp gas max.at pilot connection [mbar]     Air diff. pressure at test connection     at maximum heat release [mbar]     at minimum heat release [mbar]     CO turn down, typical (ref. 100 mg/m³ at 17% O₂)     Torque gas-air linkage [Nm]	- 25:1	- 20:1	- 17:1	0.6	0.9	0.5	0.7
Ap gas max.at pilot connection [mbar]     Air diff. pressure at test connection     at maximum heat release [mbar]     at minimum heat release [mbar]     CO turn down, typical (ref. 100 mg/m <sup>3</sup> at 17% O <sub>2</sub> )     Torque gas-air linkage [Nm]     Lp at 1 m blower, max. capacity <sup>7</sup> ) [dB(A)]	- 25:1 0.3	- 20:1 0.3	- 17:1	0.6	0.9	0.5	0.7
Δp gas max.at pilot connection [mbar]     Air diff. pressure at test connection     at maximum heat release [mbar]     at minimum heat release [mbar]     CO turn down, typical (ref. 100 mg/m³ at 17% O₂)     Torque gas-air linkage [Nm]	- 25:1 0.3 90	- 20:1 0.3 96	- 17:1	0.6 10:1 100	0.9 8:1 103 109	0.5 15:1 100	0.7 12:1 103
Excess air at min. (n) Flame length at max. capacity (open air) <sup>6)</sup> [m] Δp gas max. at burner inlet [mbar]	11.4   1.5   15.5   7.2	8.8 1.7 21.6 10.9	10 2.3 46.7 23.5	10.6 1.9 23.4 14.7 25	15 2.3 29.9 18.5 33	16.5 2.2 33.9 7.4 51	

1) Air pressure switches should be selected to have a setpoint ranging from 2-10 mbar.

2) Single phase blower motor available.

3) The EB Valupak II requires an external blower with flat characteristics.

4) As an alternative blower U/HC142 (0,18 kW) can be used. Performance is the same as with UMI300 blower.

5) Use of the standard round air inlet filter will cause a  $\pm$  15% capacity reduction. UMI blowers are not suited for filters.

6) When firing in open air. Firing in a cross flow shortens the flame.

7) Sound data refers to open firing burner in free field of conditions, at maximum capacity.

#### 10.2 VP-II burner specification, 50 Hz

Capacity and selection data in kW, 50 Hz operation. Gross heating value =  $10.9 \text{ kWh/m}^3$  (st), d = 0,6 All figures are for balanced - 0 mbar - duct pressure<sup>1</sup>)

All figures are for balanced - 0 mbar - duct pressure () Burner		VP-II-	·60 <sup>2)</sup>			VP-II-150 <sup>2)</sup>	
Blower	UHC10	2 UHC	122 U	MI300	UHC122	UMI300 <sup>4)</sup>	EB <sup>3)</sup>
Maximum heat release <sup>5)</sup> [kW] (HHV)	40	60		80	185	225	20 mbar 417
Minimum heat release [kW] (HHV)	2	2		3	6	6	9
Pilot capacity (typical) [kW] (HHV)	L	N/		0	26	32	59
Turndown <sup>1</sup> )	20:1	30:		27:1	31:1	38:1	44:1
Q gas <sub>max.</sub> [m <sub>3</sub> /h(st)]	3.7	5.5		7.3	17.9	21.8	40.4
Q gas $_{max}$ [m <sub>3</sub> /h(st)]	0,18	0,1		0,28	0,6	0,6	0,9
Q air $_{max.}$ [m <sub>3</sub> /h(st)]	48	64		98	206	251	465
$ \begin{array}{c} Q \text{ air }_{\text{max. [filg/file]}} \\ Q \text{ air }_{\text{min. [m_3/h(st)]}} \end{array} \end{array} $	40	N/		30	53	67	116
Excess air at max. (n)	1.17	1.1		1.17	1.2	1.2	1.2
Excess air at min. (n)	1.17	N/		1.17	9.5	1.2	13.2
				9.0	12	1.8	
Flame length at max. capacity (open air) <sup>6</sup> [m]	6.7	up to 0.4 (after sleeve)       6.7     11.5     24				20.8	
Δp gas max. at burner inlet [mbar]				24	14.2		71.5
Δp gas max. at burner test connection (typical) [mbar]	5.4	9		18	9.8	14.6	50.3
Δp gas max.at pilot connection [mbar]		NA	4		18	27	93
Air diff. pressure at test connection	0		<b>n</b>	6.0	0.6	1 1	15.0
at maximum heat release [mbar]	2	3,3		6,3	2.6	4,4	15.2
at minimum heat release [mbar]	0.4	0.8		0.6	0.15	0.25	-
CO turn down, typical (ref. 100 mg/m <sup>3</sup> at 17% O <sub>2</sub> )		N/			30:1	22:1	4:1
Torque gas-air linkage [Nm]		N/			0.3	0.3	0.5
Lp at 1 m blower, max. capacity <sup>7</sup> ) [dB(A)]		NA			86	86	-
Lw at max. capacity <sup>7</sup> [dB(A)]		NA		10	94	94	-
Weight [kg]	13	14.		18	20	24.2	15
Blower motor [kW]	0.09	0.0	9	0.25	0.09	0.25	0.55
Burner	VI	P-II-300 <sup>2)</sup>		VP	-II-600 VP-		II-900
Blower	UMI300 <sup>4)</sup>	UMI390	EB <sup>3)</sup> 20 mbar	UHC182	2 <sup>2)</sup> UHC20	2 UHC1822	<sup>2)</sup> UHC202
Maximum heat release <sup>5)</sup> [kW] (HHV)	290	360	633	558	634	880	1060
Minimum heat release [kW] (HHV)	6	10	12.6	15	15	15	15
Pilot capacity (typical) [kW] (HHV)	23	29	51	37	42	41	49
Turndown <sup>1)</sup>	48:1	36:1	50:1	37:1	42:1	59:1	71:1
Q gas <sub>max.</sub> [m <sub>3</sub> /h(st)]	00.1						
	28.1	34.8	61.3	54.0	61.4	85.2	102.6
Q gas <sub>min.</sub> [m <sub>3</sub> /h(st)]	0.6	34.8 1.0	61.3 1.2	54.0 1.5	61.4 1.5	85.2 1.5	
							102.6
Q air <sub>max.</sub> [m <sub>3</sub> /h(st)]	0.6	1.0	1.2	1.5	1.5	1.5	102.6 1.5
	0.6 323	1.0 401	1.2 706	1.5 622	1.5 707	1.5 981	102.6 1.5 1133
Q air <sub>max.</sub> [m <sub>3</sub> /h(st)] Q air <sub>min.</sub> [m <sub>3</sub> /h(st)]	0.6 323 55	1.0 401 72	1.2 706 117	1.5 622 144	1.5 707 174	1.5 981 205	102.6 1.5 1133 230
Q air <sub>max.</sub> [m <sub>3</sub> /h(st)] Q air <sub>min.</sub> [m <sub>3</sub> /h(st)] Excess air at max. (n)	0.6 323 55 1.2	1.0 401 72 1.2	1.2 706 117 1.2	1.5 622 144 1.2	1.5 707 174 1.2	1.5 981 205 1.2	102.6 1.5 1133 230 1.15
Q air <sub>max.</sub> [m <sub>3</sub> /h(st)] Q air <sub>min.</sub> [m <sub>3</sub> /h(st)] Excess air at max. (n) Excess air at min. (n)	0.6 323 55 1.2 9.9	1.0 401 72 1.2 7.8	1.2 706 117 1.2 10	1.5       622       144       1.2       10.3	1.5       707       174       1.2       12.5	1.5       981       205       1.2       14.7	102.6 1.5 1133 230 1.15 16.5
Q air <sub>max.</sub> [m <sub>3</sub> /h(st)] Q air <sub>min.</sub> [m <sub>3</sub> /h(st)] Excess air at max. (n) Excess air at min. (n) Flame length at max. capacity (open air) <sup>6)</sup> [m] Δp gas max. at burner inlet [mbar]	0.6 323 55 1.2 9.9 1.3	1.0     401     72     1.2     7.8     1.5     15.2	1.2 706 117 1.2 10 2.3 46.7	1.5       622       144       1.2       10.3       1.6       16.2	1.5       707       174       1.2       12.5       1.7       20.8	1.5       981       205       1.2       14.7       2       23.9	102.6 1.5 1133 230 1.15 16.5 2.2
Q air <sub>max.</sub> [m <sub>3</sub> /h(st)] Q air <sub>min.</sub> [m <sub>3</sub> /h(st)] Excess air at max. (n) Excess air at min. (n) Flame length at max. capacity (open air) <sup>6</sup> ) [m] Δp gas max. at burner inlet [mbar] Δp gas max. at burner test connection (typical) [mbar]	0.6 323 55 1.2 9.9 1.3 10.8	1.0     401     72     1.2     7.8     1.5     15.2     7.7	1.2 706 117 1.2 10 2.3 46.7 23.5	1.5       622       144       1.2       10.3       1.6	1.5       707       174       1.2       12.5       1.7       20.8       12.9	1.5       981       205       1.2       14.7       2       23.9       5.2	102.6       1.5       1133       230       1.15       16.5       2.2       33.9
Q air <sub>max.</sub> [m <sub>3</sub> /h(st)] Q air <sub>min.</sub> [m <sub>3</sub> /h(st)] Excess air at max. (n) Excess air at min. (n) Flame length at max. capacity (open air) <sup>6)</sup> [m] Δp gas max. at burner inlet [mbar]	0.6 323 55 1.2 9.9 1.3 10.8 5	1.0     401     72     1.2     7.8     1.5     15.2	1.2 706 117 1.2 10 2.3 46.7	1.5       622       144       1.2       10.3       1.6       16.2       10.2	1.5       707       174       1.2       12.5       1.7       20.8	1.5       981       205       1.2       14.7       2       23.9	102.6 1.5 1133 230 1.15 16.5 2.2 33.9 7.4
$ \begin{array}{l} \mbox{Q air }_{max.} \ [m_3/h(st)] \\ \mbox{Q air }_{min.} \ [m_3/h(st)] \\ \mbox{Excess air at max. (n)} \\ \mbox{Excess air at min. (n)} \\ \mbox{Flame length at max. capacity (open air) }^{6)} \ [m] \\ \mbox{\Deltap gas max. at burner inlet [mbar]} \\ \mbox{\Deltap gas max. at burner test connection (typical) [mbar]} \\ \mbox{\Deltap gas max.at pilot connection [mbar]} \\ \mbox{Air diff. pressure at test connection} \end{array} $	0.6 323 55 1.2 9.9 1.3 10.8 5	1.0     401     72     1.2     7.8     1.5     15.2     7.7     27	1.2 706 117 1.2 10 2.3 46.7 23.5 83	1.5       622       144       1.2       10.3       1.6       16.2       10.2	1.5       707       174       1.2       12.5       1.7       20.8       12.9       23	1.5       981       205       1.2       14.7       2       23.9       5.2	102.6     1.5     1133     230     1.15     16.5     2.2     33.9     7.4     51
Q air max. [m <sub>3</sub> /h(st)]Q air min. [m <sub>3</sub> /h(st)]Excess air at max. (n)Excess air at min. (n)Flame length at max. capacity (open air) <sup>6</sup> ) [m]Δp gas max. at burner inlet [mbar]Δp gas max. at burner test connection (typical) [mbar]Δp gas max.at pilot connection [mbar]Air diff. pressure at test connectionat maximum heat release [mbar]	0.6 323 55 1.2 9.9 1.3 10.8 5 17 3.7	1.0     401     72     1.2     7.8     1.5     15.2     7.7     27     6.5	1.2 706 117 1.2 10 2.3 46.7 23.5	1.5       622       144       1.2       10.3       1.6       16.2       10.2       17.6       6.9	1.5     707     174     1.2     12.5     1.7     20.8     12.9     23     9.7	1.5     981     205     1.2     14.7     2     23.9     5.2     35     6.6	102.6     1.5     1133     230     1.15     16.5     2.2     33.9     7.4     51     8.4
Q air max. [m <sub>3</sub> /h(st)]Q air min. [m <sub>3</sub> /h(st)]Excess air at max. (n)Excess air at min. (n)Flame length at max. capacity (open air) <sup>6</sup> ) [m]Δp gas max. at burner inlet [mbar]Δp gas max. at burner test connection (typical) [mbar]Δp gas max. at pilot connection [mbar]Air diff. pressure at test connectionat maximum heat release [mbar]at minimum heat release [mbar]	0.6 323 55 1.2 9.9 1.3 10.8 5 17 3.7 0.2	1.0     401     72     1.2     7.8     1.5     15.2     7.7     27     6.5     0.2	1.2 706 117 1.2 10 2.3 46.7 23.5 83 18.5 -	1.5       622       144       1.2       10.3       1.6       16.2       10.2       17.6       6.9       0.45	1.5     707     174     1.2     12.5     1.7     20.8     12.9     23     9.7     0.6	1.5     981     205     1.2     14.7     2     23.9     5.2     35     6.6     0.4	102.6     1.5     1133     230     1.15     16.5     2.2     33.9     7.4     51     8.4     0.5
Q air $_{max.}$ [m <sub>3</sub> /h(st)] Q air $_{min.}$ [m <sub>3</sub> /h(st)] Excess air at max. (n) Excess air at min. (n) Flame length at max. capacity (open air) <sup>6</sup> ) [m] $\Delta p$ gas max. at burner inlet [mbar] $\Delta p$ gas max. at burner test connection (typical) [mbar] $\Delta p$ gas max. at burner test connection (typical) [mbar] Air diff. pressure at test connection at maximum heat release [mbar] at minimum heat release [mbar] CO turn down, typical (ref. 100 mg/m <sup>3</sup> at 17% O <sub>2</sub> )	0.6 323 55 1.2 9.9 1.3 10.8 5 17 3.7 0.2 30:1	1.0 401 72 1.2 7.8 1.5 15.2 7.7 27 6.5 0.2 25:1	1.2 706 117 1.2 10 2.3 46.7 23.5 83 18.5 - 17:1	1.5       622       144       1.2       10.3       1.6       16.2       10.2       17.6       6.9	1.5     707     174     1.2     12.5     1.7     20.8     12.9     23     9.7	1.5     981     205     1.2     14.7     2     23.9     5.2     35     6.6	102.6     1.5     1133     230     1.15     16.5     2.2     33.9     7.4     51     8.4
Q air max. [m <sub>3</sub> /h(st)] Q air min. [m <sub>3</sub> /h(st)] Excess air at max. (n) Excess air at min. (n) Flame length at max. capacity (open air) <sup>6</sup> ) [m] Δp gas max. at burner inlet [mbar] Δp gas max. at burner test connection (typical) [mbar] Δp gas max. at burner test connection (typical) [mbar] Δp gas max. at burner test connection (typical) [mbar] Δp gas max. at pilot connection [mbar] Air diff. pressure at test connection at maximum heat release [mbar] at minimum heat release [mbar] CO turn down, typical (ref. 100 mg/m <sup>3</sup> at 17% O <sub>2</sub> ) Torque gas-air linkage [Nm]	0.6 323 55 1.2 9.9 1.3 10.8 5 17 3.7 0.2 30:1 0.3	1.0 401 72 1.2 7.8 1.5 15.2 7.7 27 6.5 0.2 25:1 0.3	1.2 706 117 1.2 10 2.3 46.7 23.5 83 18.5 -	1.5       622       144       1.2       10.3       1.6       16.2       10.2       17.6       6.9       0.45       12:1       1	1.5     707     174     1.2     12.5     1.7     20.8     12.9     23     9.7     0.6     10:1     1	1.5     981     205     1.2     14.7     2     23.9     5.2     35     6.6     0.4     20:1     1	102.6     1.5     1133     230     1.15     16.5     2.2     33.9     7.4     51     8.4     0.5     15:1     1
Q air max. [m <sub>3</sub> /h(st)] Q air min. [m <sub>3</sub> /h(st)] Excess air at max. (n) Excess air at min. (n) Flame length at max. capacity (open air) <sup>6</sup> ) [m] Δp gas max. at burner inlet [mbar] Δp gas max. at burner test connection (typical) [mbar] Δp gas max. at burner test connection (typical) [mbar] Δp gas max. at burner test connection (typical) [mbar] Δhir diff. pressure at test connection at maximum heat release [mbar] Air diff. pressure at test connection at minimum heat release [mbar] CO turn down, typical (ref. 100 mg/m <sup>3</sup> at 17% O <sub>2</sub> ) Torque gas-air linkage [Nm] Lp at 1 m blower, max. capacity <sub>7</sub> ) [dB(A)]	0.6 323 55 1.2 9.9 1.3 10.8 5 17 3.7 0.2 30:1 0.3 86	1.0 401 72 1.2 7.8 1.5 15.2 7.7 27 6.5 0.2 25:1 0.3 92	1.2 706 117 1.2 10 2.3 46.7 23.5 83 18.5 - 17:1 0.5	1.5       622       144       1.2       10.3       1.6       16.2       10.2       17.6       6.9       0.45       12:1       1       96	1.5     707     174     1.2     12.5     1.7     20.8     12.9     23     9.7     0.6     10:1     1     99	1.5     981     205     1.2     14.7     2     23.9     5.2     35     6.6     0.4     20:1     1     96	102.6     1.5     1133     230     1.15     16.5     2.2     33.9     7.4     51     8.4     0.5     15:1     1     99
Q air max. [m <sub>3</sub> /h(st)] Q air min. [m <sub>3</sub> /h(st)] Excess air at max. (n) Excess air at min. (n) Flame length at max. capacity (open air) <sup>6</sup> ) [m] Δp gas max. at burner inlet [mbar] Δp gas max. at burner test connection (typical) [mbar] Δp gas max. at burner test connection (typical) [mbar] Δp gas max. at burner test connection (typical) [mbar] Δp gas max. at pilot connection [mbar] Air diff. pressure at test connection at maximum heat release [mbar] at minimum heat release [mbar] CO turn down, typical (ref. 100 mg/m <sup>3</sup> at 17% O <sub>2</sub> ) Torque gas-air linkage [Nm]	0.6 323 55 1.2 9.9 1.3 10.8 5 17 3.7 0.2 30:1 0.3	1.0 401 72 1.2 7.8 1.5 15.2 7.7 27 6.5 0.2 25:1 0.3	1.2 706 117 1.2 10 2.3 46.7 23.5 83 18.5 - 17:1 0.5	1.5       622       144       1.2       10.3       1.6       16.2       10.2       17.6       6.9       0.45       12:1       1	1.5     707     174     1.2     12.5     1.7     20.8     12.9     23     9.7     0.6     10:1     1	1.5     981     205     1.2     14.7     2     23.9     5.2     35     6.6     0.4     20:1     1	102.6     1.5     1133     230     1.15     16.5     2.2     33.9     7.4     51     8.4     0.5     15:1     1

1) Air pressure switches should be selected to have a setpoint ranging from 2-10 mbar.

2) Single phase blower motor available.

3) The EB Valupak II requires an external blower with flat characteristics.

4) As an alternative blower U/HC142 (0,18 kW) can be used. Performance is the same as with UMI300 blower.

5) Use of the standard round air inlet filter will cause a  $\pm$  15% capacity reduction. UMI blowers are not suited for filters.

6) When firing in open air. Firing in a cross flow shortens the flame.

7) Sound data refers to open firing burner in free field of conditions, at maximum capacity.

## **11 LOGISTICS**

#### Transport

Protect the unit from external forces (blows, shocks, vibration). Report any transport damage on the unit or packaging without delay. Check that the delivery is complete.

#### Storage

→ VALUPAK-II burners shall be stored dry (inside). Burner blocks have been cured carefully before shipment and shall be kept dry. Wetting of the blocks could result in premature failures.

#### Packaging

Do not discard packing material until loose items are accounted for. The packaging material is to be disposed of in accordance with local regulations.

## **12 CERTIFICATION**

#### 12.1 Eurasian Customs Union

EHE

The products VALUPAK-II meet the technical specifications of the Eurasian Customs Union.

#### **13 DISPOSAL**

Devices with electronic components:

WEEE Directive 2012/19/EU – Waste Electrical and Electronic Equipment Directive

At the end of the product life (number of operating cycles reached), dispose of the packaging and product in a corresponding recycling centre. Do not dispose of the unit with the usual domestic refuse. Do not burn the product. On request, old units may be returned carriage paid to the manufacturer in accordance with the relevant waste legislation requirements.

## FOR MORE INFORMATION

The Honeywell Thermal Solutions family of products includes Honeywell Combustion Safety, Eclipse, Exothermics, Hauck, Kromschröder and Maxon. To learn more about our products, visit ThermalSolutions. honeywell.com or contact your Honeywell Sales Engineer. Honeywell MAXON branded products 201 E 18th Street Muncie, IN 47302 USA ThermalSolutions.honeywell.com



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