CIRCULAR INCINO-PAK®
burners for thermal incineration

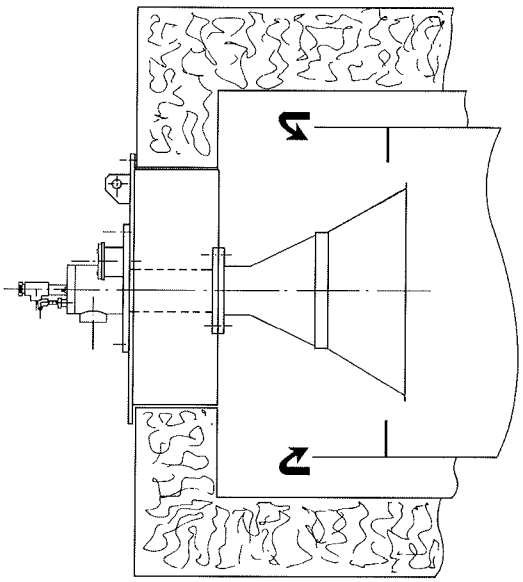
The Maxon CIRCULAR INCINO-PAK® burner has been specifically designed for the thermal incineration of combustible gaseous effluents from a wide variety of industrial processes. The CIRCULAR INCINO-PAK® is primarily designed for cylindrical combustion chambers.

PRINCIPLE OF OPERATION

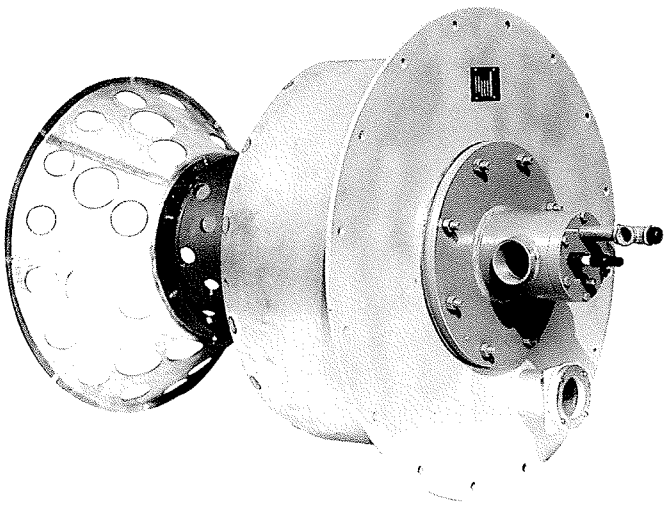
The renowned Maxon AIRFLO® principle is used in this burner. The customer installed profile plate around the burner creates a pressure drop which forces the effluent stream through the burner's cone and extension ring at high velocity, mixing it thoroughly with the fuel. With the intensive mixing and turbulent condition created in the mixing cone the required temperature is rapidly attained thereby ensuring perfect incineration of the effluents. The burner is of the nozzle-mixing type, does not need external combustion air so that only the fuel flow needs to be controlled and operates on either gas or oil.

FEATURES

- 4 sizes available: 2M, 4M, 8M and 14M, respectively 600 kW, 1200 kW, 2400 kW and 4000 kW for gas firing.
  The 4M and 8M are also available for oil firing (with atomizing air).
- Turndown: from 13 : 1 up to 60 : 1 on gas
  15 : 1 on oil.
- The Maxon CIRCULAR INCINO-PAK® can be supplied as a single burner unit or integrated in a complete burner system including a gas pipe-train and an electrical control panel.
- The mixing cone is two-part: the primary cone of a special cast alloy refractory steel, which can withstand very high temperatures. It not only guarantees resistance to high-reaching temperatures but also ensures accurate supply of oxygen bearing effluent to the burner.
  Radial and tangential drillings in this primary cone create the right swirl required to mix oxygen bearing effluent and gas correctly inside the mixing cone resulting in an excellent flame stability and a large turndown. The secondary cone is manufactured from high temperature resistant sheet metal.
- The special connection between the primary and secondary mixing cone allows for expansion in all directions. The construction is such that no mounting or support brackets are required, thus avoiding deformation.
- If necessary, the secondary mixing cone can easily be replaced.
  The 2M CIRCULAR INCINO-PAK® burner has a one-piece mixing cone.
- A special feature is the central fuel inlet on which a spark ignitor, a pilot and sight tube for the UV-cell are mounted. These vital parts which do not need any cooling air are easily retractable and protected from the heat emanating from the combustion chamber.
- The gas burner can be ignited by means of an integrated pilot burner or by direct ignition of the main burner in low fire position.
- The CIRCULAR INCINO-PAK® burner does not need external combustion air which means considerable savings in primary energy.
- The application of a Maxon CIRCULAR INCINO-PAK® greatly simplifies the construction of the incinerator.



Cross sectional view



8M CIRCULAR INCINO-PAK® burner

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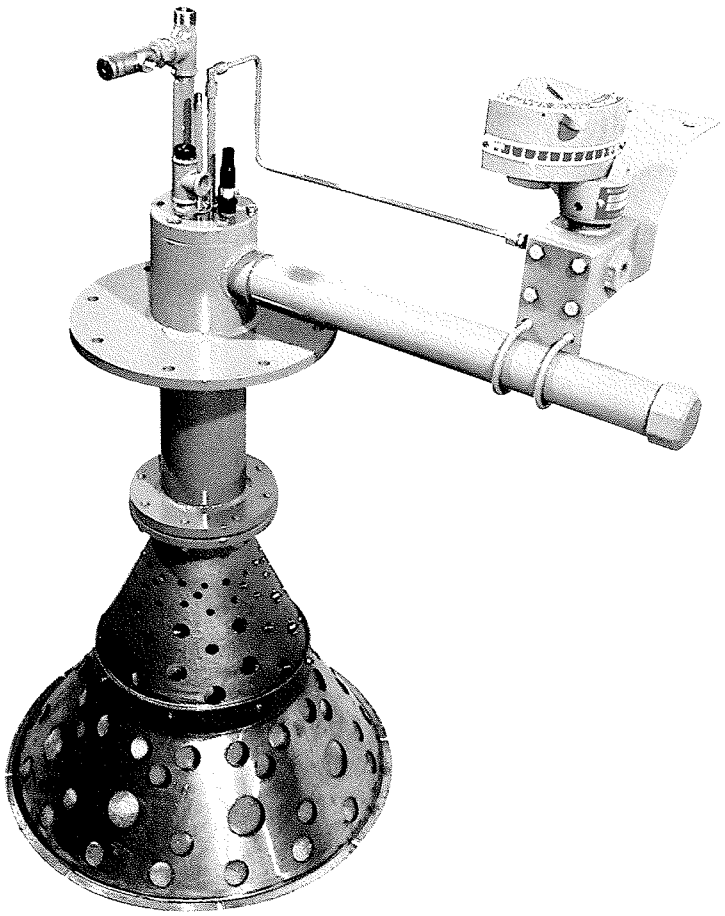
APPLICATIONS

- Wherever exhaust gases from ovens need to be incinerated to prevent pollution of the environment high performance is achieved with the Maxon CIRCULAR INCINO-PAK®.
- Typical applications are:
  Paint-baking ovens, textile dryers, wire enamelling, printing presses, fibreglass curing, metal coating lines, coil coating ovens.



4M CIRCULAR INCINO-PAK® burner (oil) shown with options:
- UV sight tube with cooling air adjustable orifice
- oil control valve with connection to burner
- oil control valve support

For further information refer to:

11.300.2 Specifications
11.300.3 Design considerations
11.300.4 Installation instructions
11.300.6 Start-up instructions
11.300.7 Maintenance and repair instructions.

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SPECIFICATIONS

Air stream flammability limits and/or minimum oxygen content levels need to be determined since oxygen content within the effluent is critical to the flammability range of any raw gas type burner. Maximum capacity (kW) of a CIRCULAR INCINO-PAK® burner is influenced by the oxygen content of the effluent.

The chart below relates the incoming air stream temperatures (°C) and the percentage of oxygen (wet) remaining in this effluent.

Any combination of temperature and oxygen level falling above the acceptable curve should support combustion with a raw gas CIRCULAR INCINO-PAK® burner system.

PROFILING FOR HIGHER TEMPERATURE APPLICATIONS

When calculating profile dimensions for CIRCULAR INCINO-PAK® burner systems in applications with higher inlet air temperatures, greater temperature rises, and/or variable air stream volumes, the effluent with elevated temperatures and densities must be considered.

BURNER DESIGN PARAMETERS

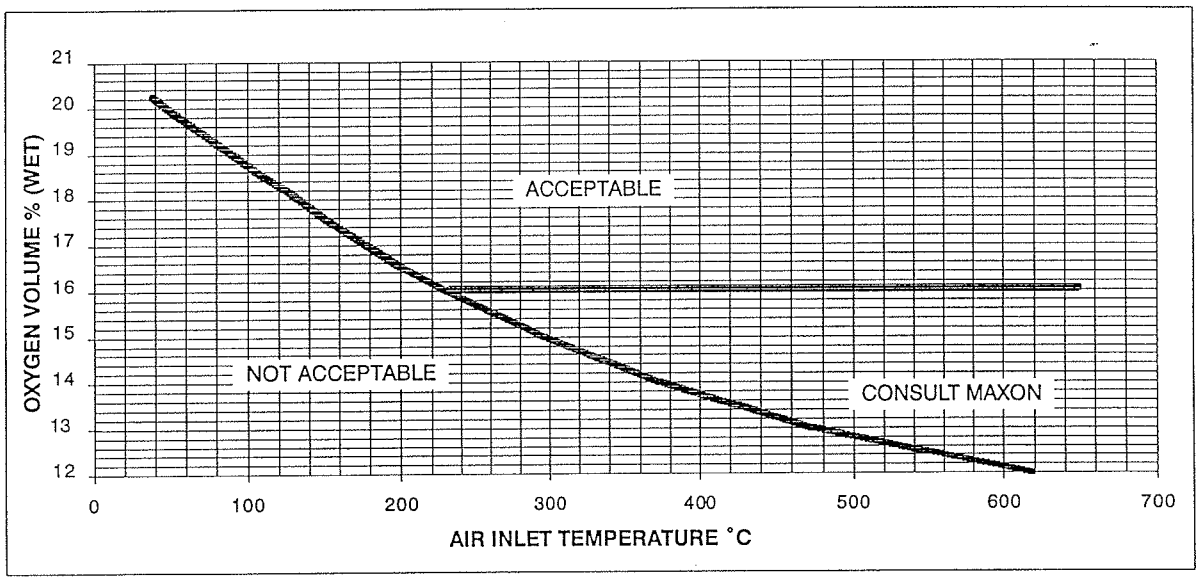
Temperature limits:

Maximum inlet temperature : 650°C
Maximum outlet temperature : 930°C

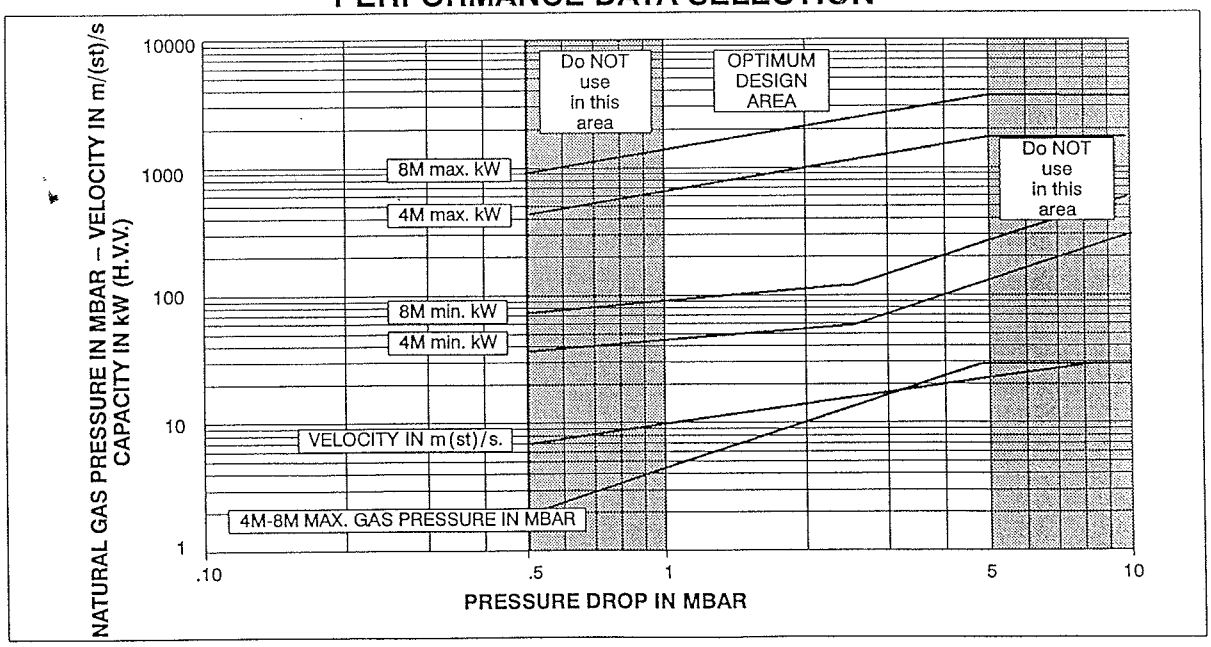
Burner displacement area:

2M size : 386 cm^2
4M size : 2024 cm^2
8M-14M size : 1637 cm^2

AIR STREAM FLAMMABILITY CHART FOR 2M, 4M, 8M AND 14M



PERFORMANCE DATA SELECTION



SPECIFICATIONS

CONNECTIONS

Main gas inlet: Rp 2.
The special spark ignitor (thread 14 mm) can be easily retracted and replaced from the outside.
A pressure test connection of Rp 1/8 is provided for the adjustment of the main gas pressure. Oil and atomizing air connections are also Rc 1/8 for 4M and Rc 1/4 for the 8M burner.
The scanner connection is Rp 3/4. The scanner is not part of the assembly. Maxon recommends the installation of UV-scanners.

IMPORTANT

Shut off pilot gas supply once the main flame is stable.
The UV-scanner does not need cooling air as it is cooled by the gas supply.
The oil versions require a gas pilot.

NOTE: BURNER NOZZLES ASSEMBLIES NEED TO BE REPLACED FOR ALTERNATIVE FUELS.

CAPACITY AND SELECTION DATA IN kW

Maximum capacities and gas pressures required for natural gas based on gross heating value = 10.9 kWh/m³(st) (39.3 MJ/m³), d = 0.6
For light oil based on gross heating value = 12.5 kWh/kg (45 MJ/m³), S.G. 0.865 kg/l

		Gas				Oil	
Burner size		2M	4M	8M	14M	4M	8M
Capacity kW (HHV)	Max.	600	1200	2400	4000	[1]	[1]
	Min.	10	60	120	310		
	Pilot	10	60	60	310		
Capacity kg/h	Max.					99	198
	Min.		—	—	—	7	13
Capacity kW gas [2]	Pilot					180	180
Pressure drop process air in mbar [3]		2.5	2.5	2.5	2.5	2.5	2.5
Max. differential gas pressure in mbar		33	14	14	350		
Pilot differential gas pressure in mbar						0.1	0.1
Oil pressure in bar						4.2	4.2
Atomizing air pressure in bar						4.2	4.2
Atomizing air flow in nm³/h						32	64
Maximum temperatures °C	Inlet	650	650	650	650	650	650
	Outlet	930	930	930	930	930	930
Displacement area in cm²		386	2024	1637	1637	2024	1637

[1] *Gas pilot start required.*
[2] *Atomizing air on.*
[3] *At operating condition. See also selection chart on page 11.300.2.1*

ASSEMBLY NUMBERS

The assembly numbers hereafter include the burner assembly with wall mounting plug, spark ignitor and test connection. The UV-scanner is not included.

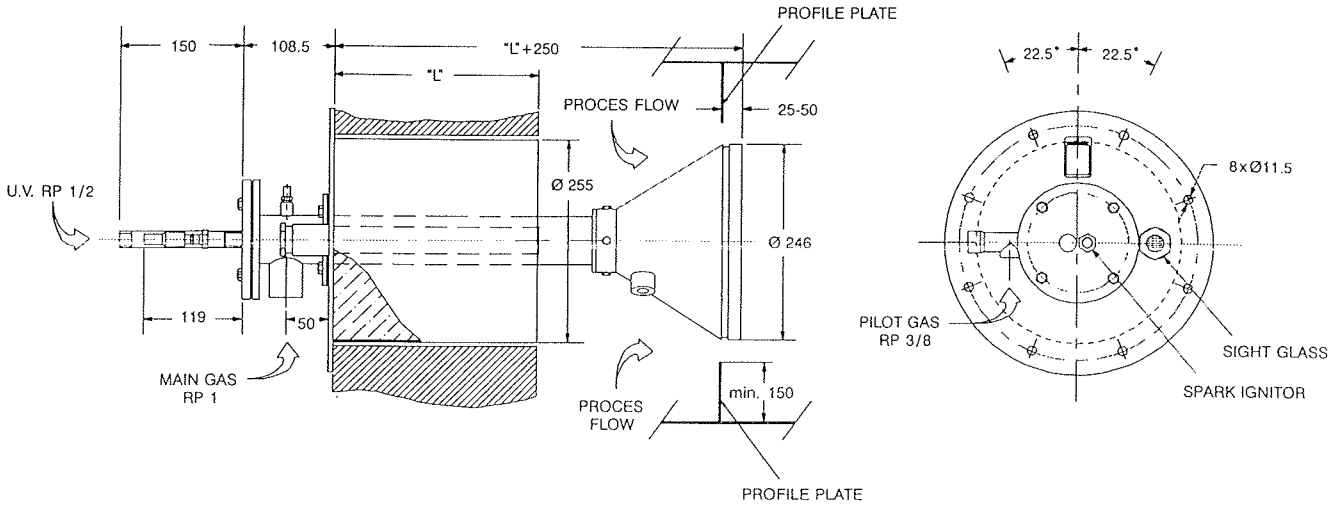
Designation	Assembly numbers			
	Burner assy		Burner with wall mounting plug	
	Gas	Oil	Gas	Oil
CIRCULAR INCINO-PAK® 2M [1]	300722	—	300726	—
CIRCULAR INCINO-PAK® 4M [1]	300241	300697	300252	300699
CIRCULAR INCINO-PAK® 8M [1]	300250	300698	300253	300700
CIRCULAR INCINO-PAK® 14M [1]	300715	—	300719	—
Nozzle sub-assembly CIRCULAR INCINO-PAK® 2M	300720	—	300720	—
Nozzle sub-assembly CIRCULAR INCINO-PAK® 4M	300243	300442	300243	300442
Nozzle sub-assembly CIRCULAR INCINO-PAK® 8M	300251	300569	300251	300569
Nozzle sub-assembly CIRCULAR INCINO-PAK® 14M	300717	—	300717	—
Spark ignitor 2M [2]	300723	—	300723	—
Spark ignitor 4M [2]	300244	300443	300244	300443
Spark ignitor 8M [2]				
Spark ignitor 14M [2]	300718		300718	

[1] *includes spark ignitor*
[2] *Specify serial number of burner or total length of ignitor when ordering spare ignitor.*

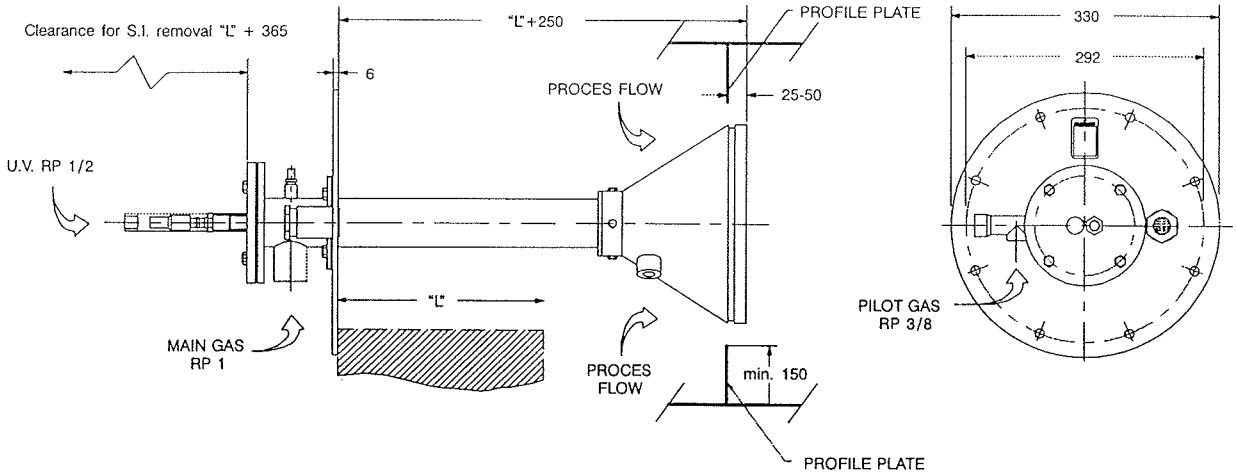
DIMENSIONS CIRCULAR INCINO-PAK® - GAS VERSION IN mm

(unless stated otherwise)

CIRCULAR INCINO-PAK® 2M WITH WALL MOUNTING PLUG



CIRCULAR INCINO-PAK® 2M FOR THROUGH-WALL MOUNTING

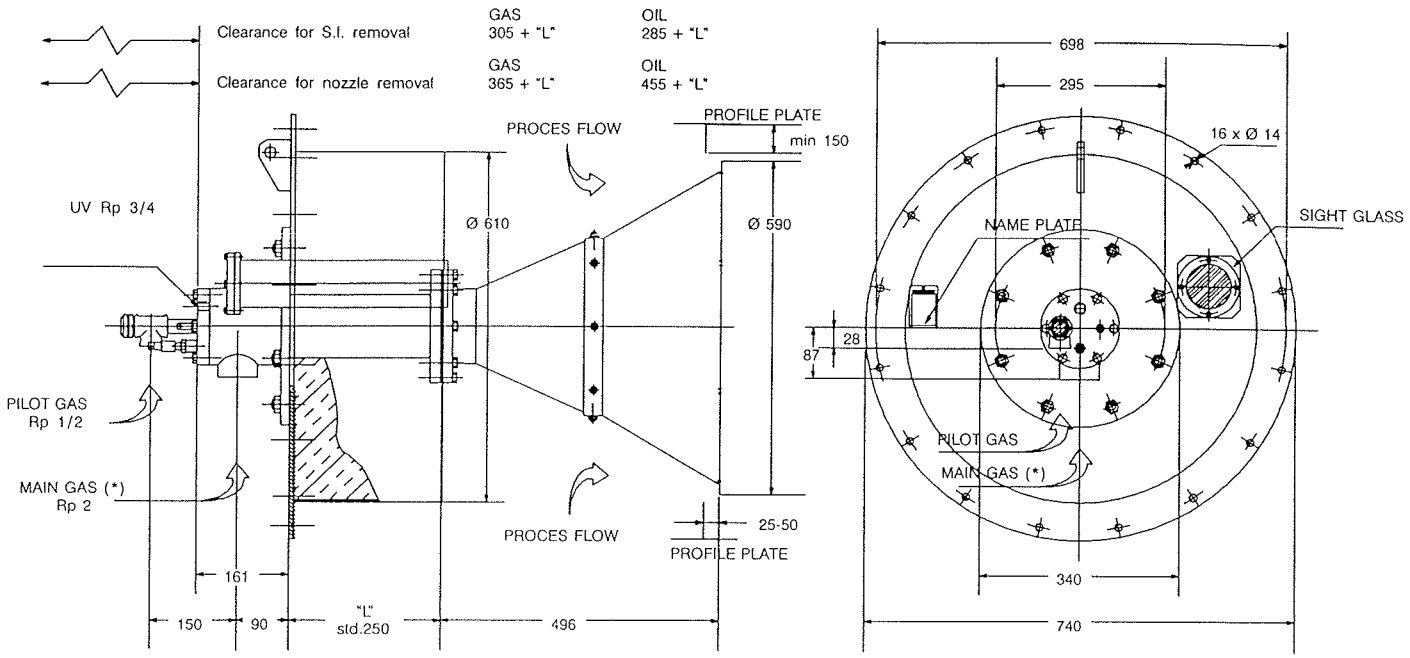


NOTE: "L"= wall thickness

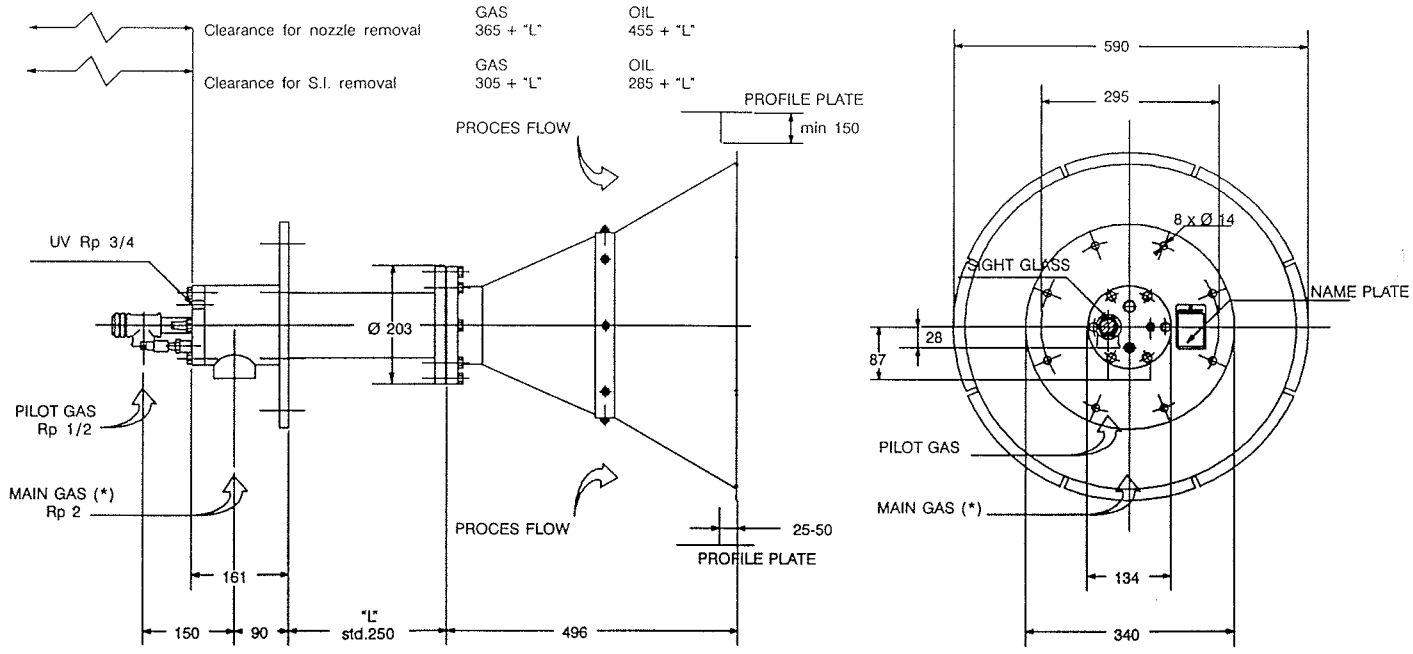
DIMENSIONS CIRCULAR INCINO-PAK® - GAS VERSION IN mm

(unless stated otherwise)

CIRCULAR INCINO-PAK® 4M AND 8M WITH WALL MOUNTING PLUG



CIRCULAR INCINO-PAK® 4M AND 8M FOR THROUGH-WALL MOUNTING



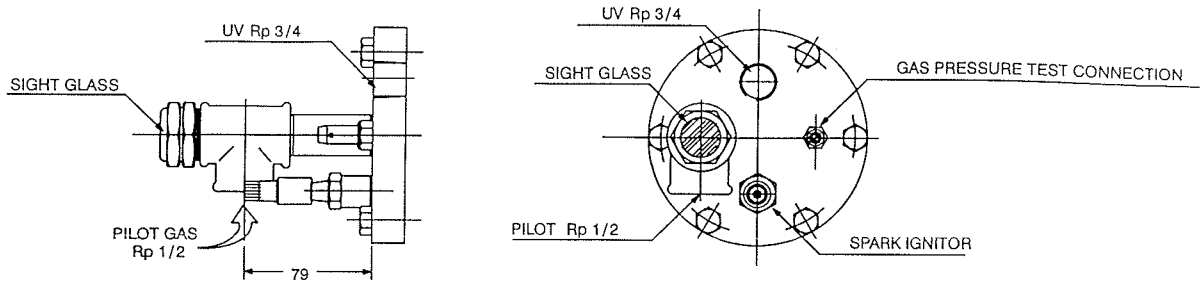
(*) to be plugged for oil only firing.

NOTE: "L" = minimum wall thickness

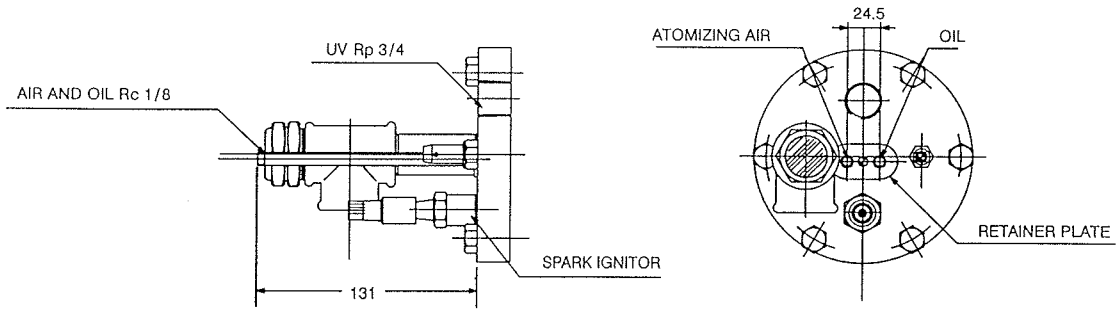
DIMENSIONS CIRCULAR INCINO-PAK® IN mm

(unless stated otherwise)

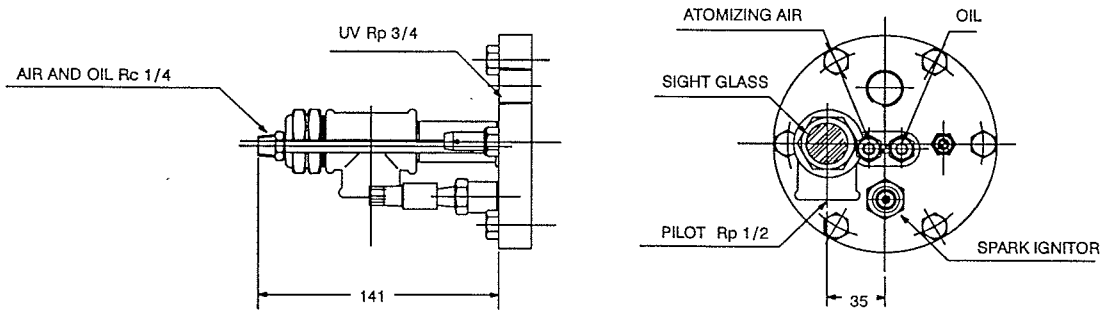
BACK PLATE - GAS VERSION 4M - 8M



BACK PLATE - OIL VERSION 4M



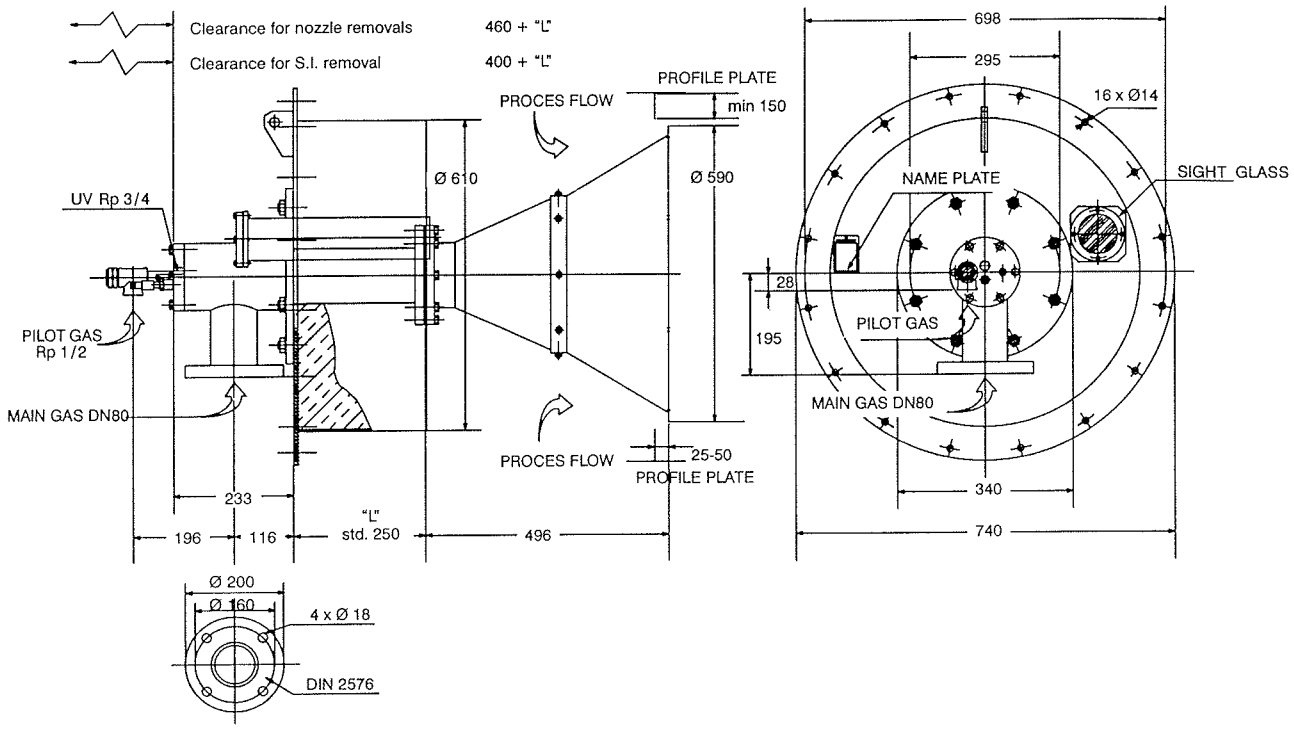
BACK PLATE - OIL VERSION 8M



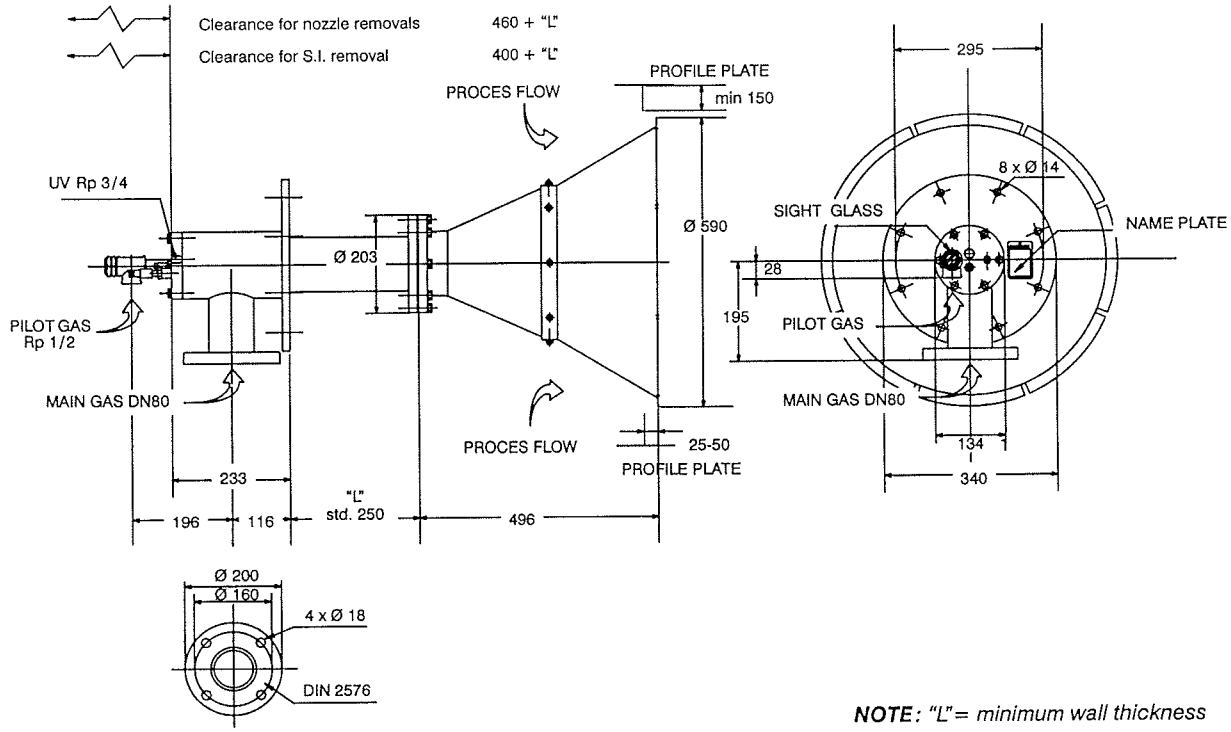
DIMENSIONS CIRCULAR INCINO-PAK® - GAS VERSION IN mm

(unless stated otherwise)

CIRCULAR INCINO-PAK® 14M WITH WALL MOUNTING PLUG



CIRCULAR INCINO-PAK® 14M FOR THROUGH-WALL MOUNTING



NOTE: *"L"= minimum wall thickness*

DESIGN AND APPLICATION DETAILS
CALCULATION EXAMPLE

CALCULATING CIRCULAR INCINO-PAK® BURNER CAPACITY REQUIREMENTS IN EFFLUENT AIR STREAMS:

To calculate heat requirements determine:

m^3(st)/h of effluent air stream
°C inlet air temperature
°C outlet air temperature

GENERAL SELECTION PROCEDURE

1. **Determine available oxygen level in air stream to be heated.**
   For a raw gas application with an oxygen level exceeding 16%.

2. **Determine the m^3(st)/h of air through the incinerator. Include any variations in this flow.**
   Assuming a constant volume air fan of 8500 m^3(st)/h at 15°C.

3. **Determine inlet temperature of effluent to CIRCULAR INCINO-PAK® burner.**
   e.g. 440°C.

4. **Determine outlet or discharge temperatures from the incinerator**
   e.g. 800°C.

5. **Calculate maximum total heat required.**

   kW = m^3(st)/h x "K"
   (from chart below)

   Multiply m^3(st)/h of air by multiplier "K", which combines hypothetical available heat to give the value in kW required being "gross heating value" of fuel. Since multiplier "K" varies with inlet and discharge air temperature, the various factors are graphically shown below:

Enter chart at 440°C inlet temperature line (X-axis), follow across to intersect the 800°C discharge temperature sloped line, then read the Y-axis 0.172. Therefore, the maximum heat input required is:

kW = 8500 m^3(st)/h x 0.172 = 1462 kW

Select 8M Incino-pak burner

CALCULATING CIRCULAR INCINO-PAK® PROFILE OPENING (see table 2 on page 11.300.3.2).

For optimum performance 2.5 mbar pressure drop over burner is recommended.
Read from table: net free area per 1000 actual m^3/h.

8500 m^3(st)/h = 8500 x $\frac{273 + 440}{288}$ = 21,043.4 m^3/h (actual).

From table 2 at 2.5 mbar pressure drop and 450°C find 113.59 cm^2 net free area per 1000 m^3/h (actual).
We want 2.5 mbar at 440°C.

$$\sqrt{\frac{450 + 273}{440 + 273}} \times 111\ cm^2 = 111.78\ cm^2$$

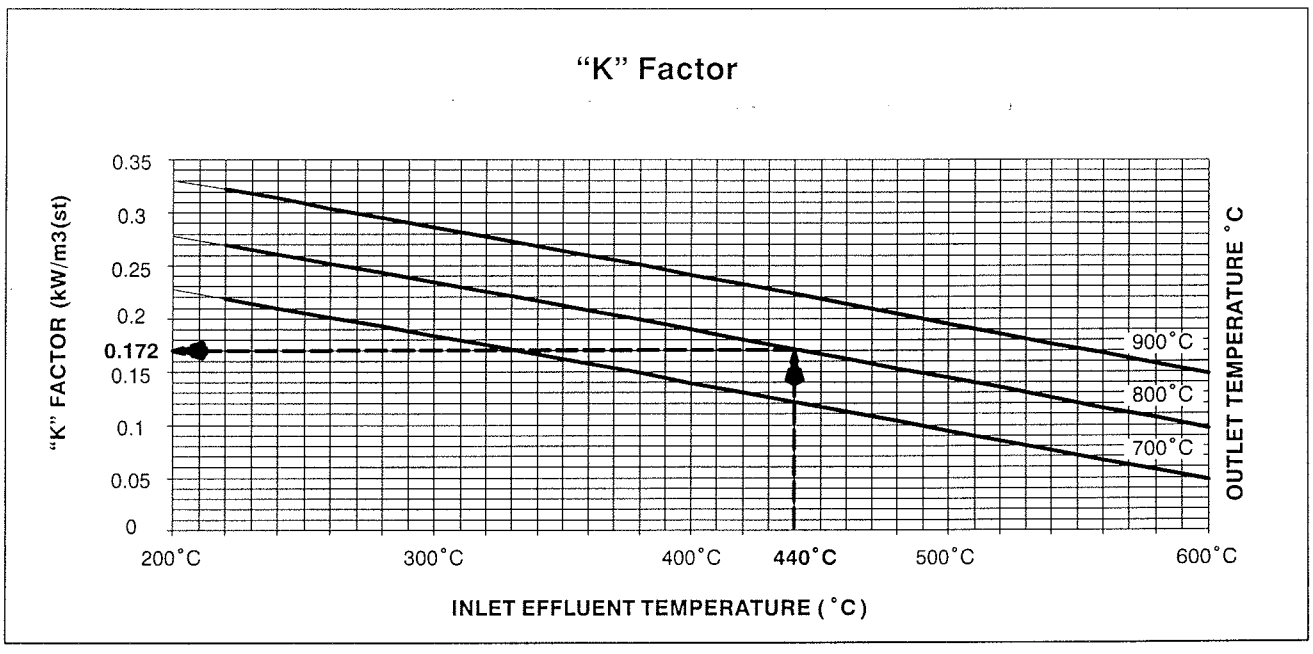
Total net free area = $\frac{21,043.4}{1000}$ x 111.78 cm^2 = 2352.14 cm^2

Gross area = net free area + burner displacement area
The selected 8M burner having a displacement area of 1637 cm^2.

Gross area = 2352.14 + 1637 = 3989.14 cm^2.

Radius of profile = $\sqrt{\frac{3989.14}{3.14}}$ = 35.63 cm

Diameter of profile = 2 x 35.63 = 71.26 cm



DESIGN AND APPLICATION DETAILS

FOR 2M BURNERS

Table 1: net free area (cm^2) required for 1000 actual m^3/h air flow.

Pressure drop mbar	Inlet temperature °C													
	15	50	100	150	200	250	300	350	400	450	500	550	600	650
1.00	217	205	191	179	170	161	154	148	142	137	133	129	125	121
1.25	195	184	171	161	152	144	138	132	127	123	119	115	112	109
1.50	178	168	156	147	139	132	126	121	116	112	108	105	102	99
1.75	164	155	144	136	128	122	117	112	108	104	100	97	94	92
2.00	154	145	135	127	120	114	109	105	101	97	94	91	88	86
2.25	145	137	127	120	113	108	103	99	95	92	88	86	83	81
2.50	138	130	121	113	107	102	98	94	90	87	84	81	79	77
2.75	131	124	115	108	102	97	93	89	86	83	80	78	75	73
3.00	126	119	110	104	98	93	89	85	82	79	77	74	72	70
3.25	121	114	106	100	94	90	86	82	79	76	74	71	69	67
3.50	116	110	102	96	91	86	82	79	76	73	71	69	67	65
3.75	112	106	99	93	88	83	80	76	73	71	69	66	65	63
4.00	109	103	96	90	85	81	77	74	71	69	66	64	62	61
4.25	105	100	93	87	82	78	75	72	69	67	64	62	61	59
4.50	103	97	90	85	80	76	73	70	67	65	63	61	59	57
4.75	100	94	88	82	78	74	71	68	65	63	61	59	57	56
5.00	97	92	85	80	76	72	69	66	64	61	59	58	56	54
5.25	95	90	83	78	74	70	67	65	62	60	58	56	55	53
5.50	93	88	81	77	72	69	66	63	61	59	57	55	53	52
5.75	91	86	80	75	71	67	64	62	59	57	55	54	52	51
6.00	89	84	78	73	69	66	63	60	58	56	54	53	51	50

FOR 4M - 8M AND 14M BURNERS

Table 2: net free area (cm^2) required for 1000 actual m^3/h air flow.

Pressure drop mbar	Inlet temperature °C													
	15	50	100	150	200	250	300	350	400	450	500	550	600	650
1.00	279	263	245	230	218	207	198	190	182	176	170	165	160	156
1.25	249	235	219	206	195	185	177	170	163	157	152	148	143	139
1.50	228	215	200	188	178	169	161	155	149	144	139	135	131	127
1.75	211	199	185	174	164	156	149	143	138	133	129	125	121	118
2.00	197	186	173	163	154	146	140	134	129	124	120	117	113	110
2.25	186	176	163	153	145	138	132	126	122	117	113	110	107	104
2.50	176	167	155	146	138	131	125	120	115	111	108	104	101	99
2.75	168	159	148	139	131	125	119	114	110	106	103	99	97	94
3.00	161	152	141	133	126	119	114	109	105	102	98	95	92	90
3.25	155	146	136	128	121	115	110	105	101	98	94	91	89	86
3.50	149	141	131	123	116	111	106	101	97	94	91	88	86	83
3.75	144	136	127	119	112	107	102	98	94	91	88	85	83	80
4.00	139	132	123	115	109	103	99	95	91	88	85	82	80	78
4.25	135	128	119	112	106	100	96	92	88	85	83	80	78	76
4.50	131	124	115	108	103	98	93	89	86	83	80	78	75	73
4.75	128	121	112	106	100	95	91	87	84	81	78	76	73	71
5.00	125	118	110	103	97	93	88	85	82	79	76	74	72	70
5.25	122	115	107	100	95	90	86	83	80	77	74	72	70	68
5.50	119	112	104	98	93	88	84	81	78	75	73	70	68	66
5.75	116	110	102	96	91	86	82	79	76	73	71	69	67	65
6.00	114	107	100	94	89	84	81	77	74	72	69	67	65	64

SPECIFIC INSTALLATION INSTRUCTIONS FOR MAXON CIRCULAR INCINO-PAK® BURNER SYSTEM

Before reading following "installation instructions" please refer to the "general instructions" on burner system installation, piping lay out, pipe size and manifolding, electrical installation and burner installation.

Instructions provided by the company responsible for the manufacture 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 our nearest branch office or representative.

SPECIFICALLY :

General instructions for the installation, verification and connection of the principal elements of a Maxon combustion system. 0.000.4.1
0.000.4.2

Pipe sizing and manifolding 0.000.4.10
0.000.4.11
0.000.4.12

Electrical installation 0.000.4.14

IMPORTANT: do not discard packing material until all loose items are accounted for.

The **CIRCULAR INCINO-PAK®** burner is used only for the heating of air in motion. It should be mounted so as to direct its flame **parallel to** and **in the same direction** as the **movement of the air** which is to be heated.

Do **not** mount the **CIRCULAR INCINO-PAK®** assembly so that the flow of air is across the face of the cone. Nor should it be mounted too near to a turn in the duct which will cause the air to be directed at an angle over the burner.

Velocity and flow of air at operating temperature must be uniform and not less than the values specified for the application.

For best mixing downstream, the profile plate should extend a minimum of 150 mm from the walls of the duct around the entire burner assembly.

Install profile plates to attain this velocity.

To ensure proper operating design pressure drop for optimum performance of the Maxon CIRCULAR INCINO-PAK® burner, it is necessary to reduce the duct area at the location of the burner assembly. This is done by "silhouetting" the burner element with an opening in a plate at right angles to the direction of the air stream movement.

The profile opening should be shaped to frame your burner as symmetrically as possible, and sized to maintain the desired operating pressure drop through the spaced opening surrounding the burner element.

All Maxon CIRCULAR INCINO-PAK® burner assemblies must have a specific design operating pressure drop across and through the burner element. Consult Maxon catalogue specification for the pressure drop required to obtain the burner capacity for the specific application. Install profile plates to attain this pressure drop.

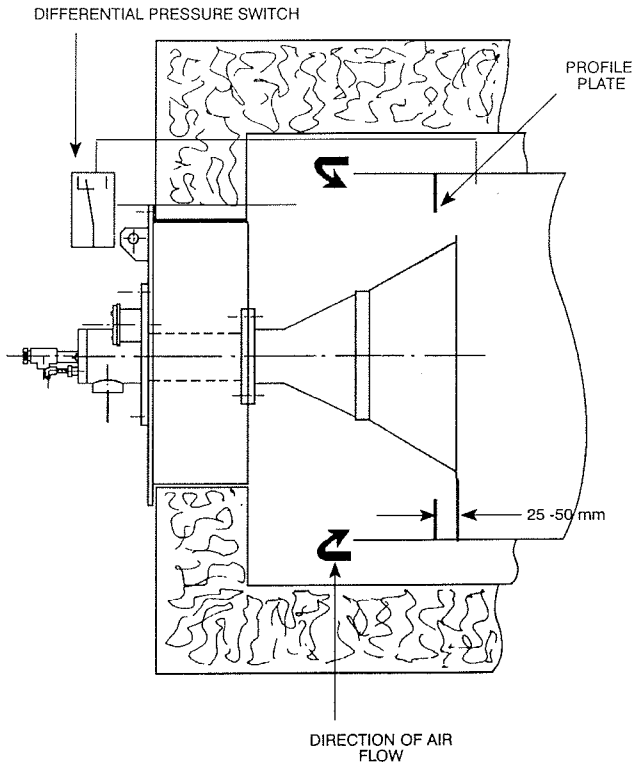
The burner cone should protrude about 25 mm to 50 mm through the profile plate.

Install a differential pressure switch across the profile plate to make sure the burner can only operate when air velocity is high enough.

Provide sufficient test connections for measuring process differential pressure.

Observation ports located in duct to permit visual inspection of pilot and main burner flame(s) help on initial start-up, as well as with routine maintenance/ inspections.

Allow clearance for removal of spark ignitor.

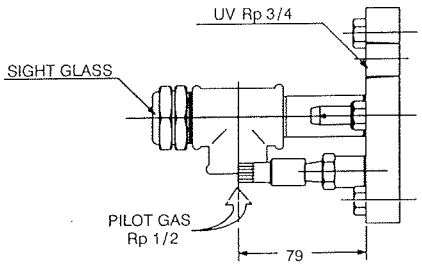


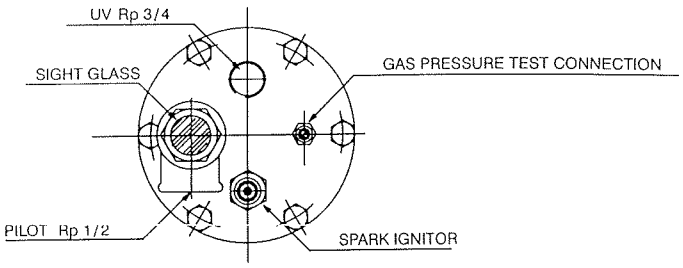
All data shown on this page are subject to change without notice.

DIMENSIONS CIRCULAR INCINO-PAK® IN mm

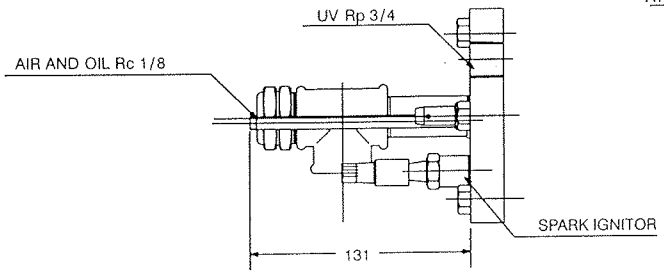
(unless stated otherwise)

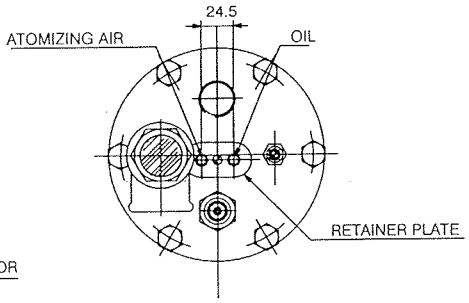
BACK PLATE - GAS VERSION 4M - 8M



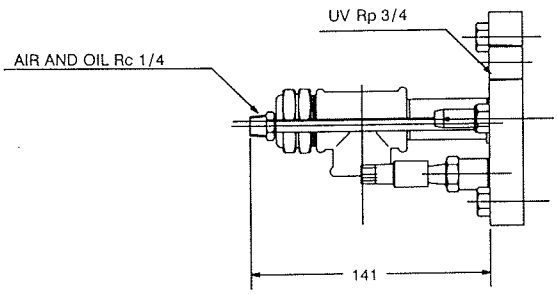


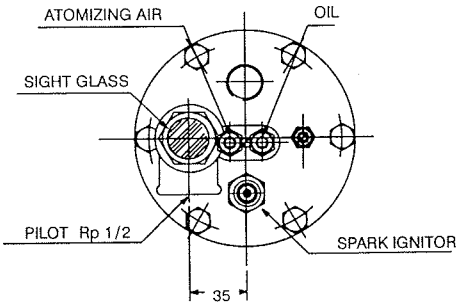
BACK PLATE - OIL VERSION 4M





BACK PLATE - OIL VERSION 8M





All data shown on this page are subject to change without notice.

START-UP INSTRUCTIONS FOR MAXON "CIRCULAR INCINO-PAK®" BURNERS

Instructions provided by the company responsible for the manufacture 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 our nearest branch office or representative.

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 operation of the "CIRCULAR INCINO-PAK®" burner system has been installed and piped in accordance with the "Specific Installation Instructions" (page 11.300.4.1). If the burner system is part of a complete incinerator or other heating unit which has been purchased as a complete prepiped and prewired package, it may be assumed that these instructions have already been carried out by the 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 overall installation.

A. GAS VERSION

The CIRCULAR INCINO-PAK® is a raw gas burner. There is no flammable air-gas mixture in the feeder line and, therefore, a flashback cannot occur. However, the burner depends completely on the effluent air to supply the oxygen for combustion. A correct pressure drop is therefore very important. The nominal process air pressure drop is 1-2.5 mbar, and should be checked prior to start-up as well as the burner installation and its profile plate, the electrical wiring and the leak testing of the pipe-train.

1. **Necessary tools**
   - A set of Allen screwdrivers.
   - A manometer (U-type preferable).
   - A set of screwdrivers and wrenches.
2. **Bleed air from the gas pipe-train; the strainer can assist**
3. **Start main process fans; check pressure differential over burner.** Check that all duct and chamber dampers are properly positioned and locked into operating positions.
4. **Light the pilot as follows :**
   - Set the pilot regulator to get a reliable ignition of the pilot (slightly above combustion chamber pressure).
   - The pilot flame will be yellow-blue and will fill about half of the first cone. **Note:** dust and/or chemicals entrained into passing air stream may affect physical color of flame.
   - The capacity of the pilot is 10-310 kW. Verify if pilot regulator can handle this volume.
5. **Adjustment of the Maxon "CV" gas control valve** (see also page 4.400.6.1 - 6.2)
   - Disconnect the control motor.
   - Place the handle of the "CV" valve in the low-fire position with the inscription "LO" on the handle opposite the mark on the valve body; the valve is now closed. Then open the main gas shut-off valve.
   - Turn the low-fire adjustment screw on the "CV" valve handle clockwise until the flame fills about half of the first cone, like the pilot flame. To verify close pilot cock.
   - Open the gas control valve completely. Set the main gas regulator to obtain the rated differential gas pressure (see page 11.300.2.2).
     At high-fire the flame will extend about 1 m beyond the end of the mixing cone extension ring, but this length will vary depending on the actual pressure drop.
   - Connect the control motor in such a manner that it travels between the minimum and maximum position of the "CV" valve.
6. **Operate the control valve several times** by adjusting the temperature controller higher and lower.
   Make sure that the adjustment is satisfactory and reproducible.
   Check all other safety devices such as pressure switches, high temperature limits etc... and adjust these devices to their correct value.

START-UP INSTRUCTIONS FOR MAXON "CIRCULAR INCINO-PAK®" BURNERS

B. OIL VERSION

1. **Necessary tools**
   - A set of Allen screwdrivers.
   - A manometer (U-type preferable).
   - A set of screwdrivers and wrenches.
   - Oil flowmeter if not mounted.

2. **Bleed air from pilot gas pipe-train and oil fuel line**

3. **Start main process fans; check pressure differential over burner**

4. **Light the pilot as follows :**
   - Set the pilot regulator to get a reliable ignition of the pilot (slightly above combustion chamber pressure).
   - The pilot flame will be yellow-blue and will fill about half of the first cone.

     Note:
     dust and/or chemicals entrained into passing air stream may effect plysical calor of flame.

   - The capacity of the pilot is 180 kW. Verify if pilot regulator can handle this volume.

5. **Establish atomizing air**
   Use of air solenoid valve, interlocked with the oil solenoid valve, is recommended. Air pressure regulator adjusted to 4.2 bar at burner. Use a low pressure atomizing air pressure switch set to break at 4.1 bar. Introduction of atomizing air may require pilot gas readjustment.

6. **Open manual oil valve**
   Assuming all other interlocked safety devices are made, oil solenoid valve is now open. But first be sure you are ready to immediately proceed with main flame adjustment, with control linkage disconnected.

REMARK: PROTECT UV SCANNER OVERHEATING DURING COOL DOWN PERIOD OF OVEN.

7. **Adjust main oil flame** (see page 4.200.6.1)
   Still at low-fire, adjust oil control valve to setting for catalogue-rated minimum of burner. Simultaneously, set oil pressure regulator for 4.2 bar outlet. Use oil flowmeter for rate-of-flow indication ; but check main flame to assure proper flame characteristics with complete absence of smoke, soot, odor and unvaporized oil particles.
   In a similar manner, establish proper flow rates at all other positions of the oil control valve while continuing check of main flame characteristics. Oil pressure regulator should require no further adjustment, as multiple-screw oil valve will self-compensate for repetitive small drops in oil pressure.
   After completion of the adjustment, cycle the burner to low-fire. Turn oil off. Turn pilot off. Reignite pilot and main flame. Cycle burner several times while checking signal as per flame safeguard manufacturer's instructions.

8. **Set low oil pressure switch**
   If used, switch should break just below established oil pressure at the sensed point, on the outlet side of the oil pressure regulator.

9. **Check all interlocking safety devices for proper action and response**

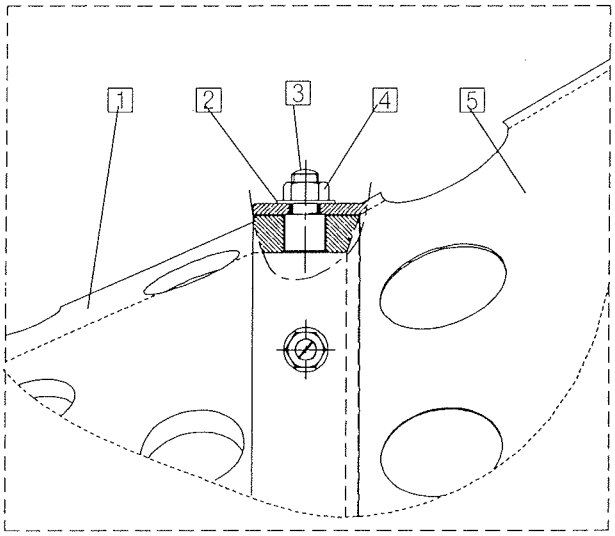
RECOMMENDED SEQUENCE WHEN FIRING OIL:

For light-off:	**For shut-down:**
1.Oven purged	1. Cycle to low-fire
2.Pressure differential switch	2. Ignite gas pilot
3.Burner at low-fire	3. Main oil off
4.Ignite gas pilot	4. Atomizing air off
5.Atomizing air on	5. Pilot gas off
6.Establish main flame	6. Cool-down oven
7.Close pilot gas valve	
8.Release to modulation	

MAINTENANCE INSTRUCTIONS FOR MAXON "CIRCULAR INCINO-PAK®" BURNERS

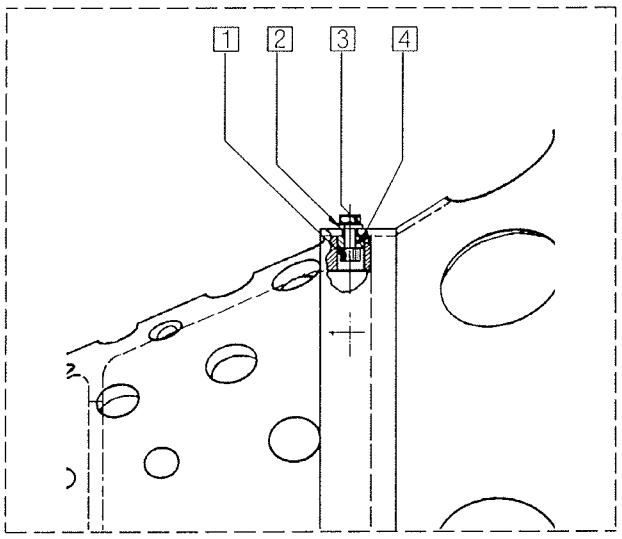
MIXING CONE EXTENSION REPLACEMENT.

1. Remove burner assembly.
2. Remove 8 nuts M6 [4], hold extension ring retainer [3]. with screw driver and remove retainer washer [2].
3. Remove cone extension.
4. Mount burner assembly and reconnect gas supply, spark ignitor, scanner and pilot gas supply. Check for gas leaks.



Nr	Part Nr	Item name	Quantity
1	—	Mixing cone	1
2	370143	Washer DIN 125 Ø 6,4	8
3	041779	Spacer/retainer	8
4	370144	Hex nut M6 DIN 934	8
5	—	Mixing cone extension	1

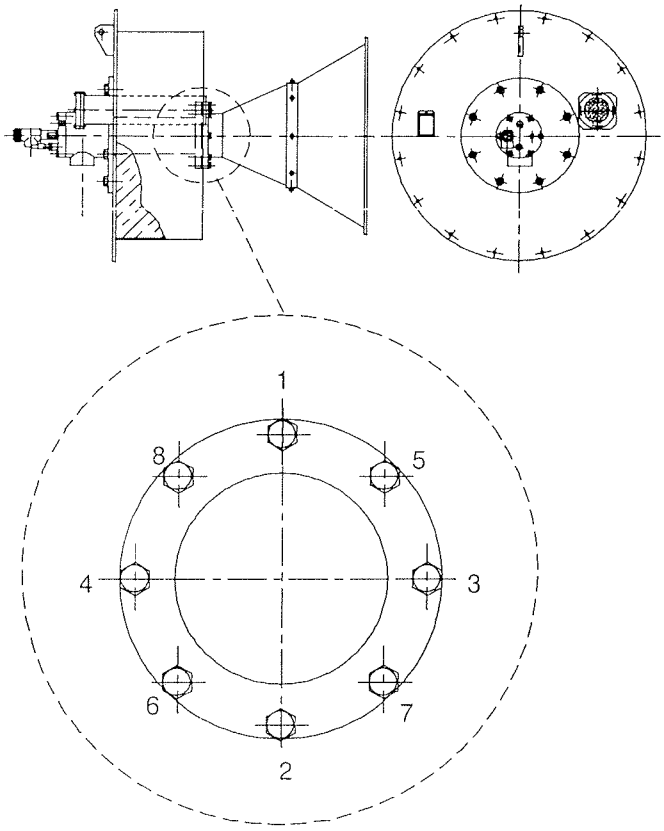
MIXING CONE EXTENSION DESIGN FOR BURNERS PRIOR TO 1993 FOR REPLACEMENT: SEE INSTRUCTIONS ABOVE

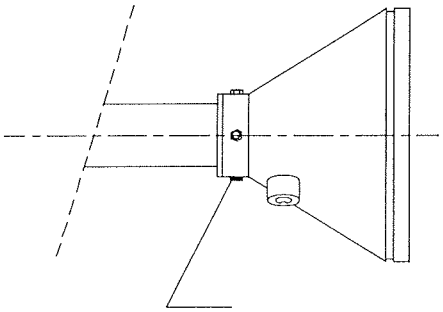


[1][1] SOCKET SCREW
[2][1] WASHER
[3][1] NUT
[4][1] BUSHING

MAINTENANCE INSTRUCTIONS FOR MAXON "CIRCULAR INCINO-PAK®" BURNERS

MIXING CONE REPLACEMENT

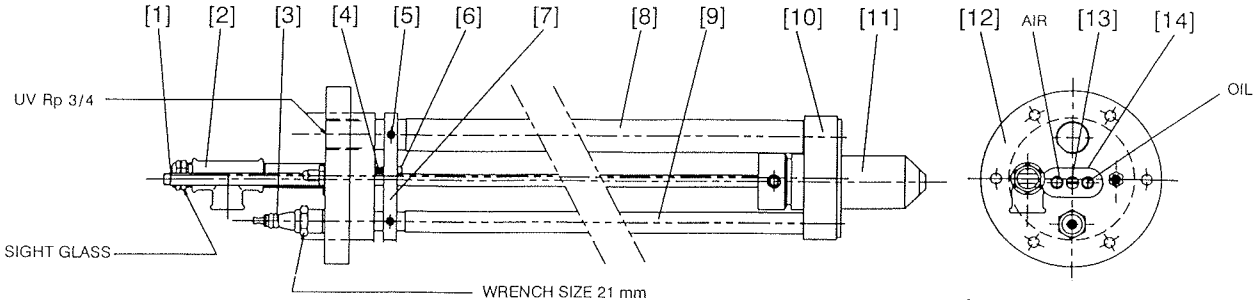


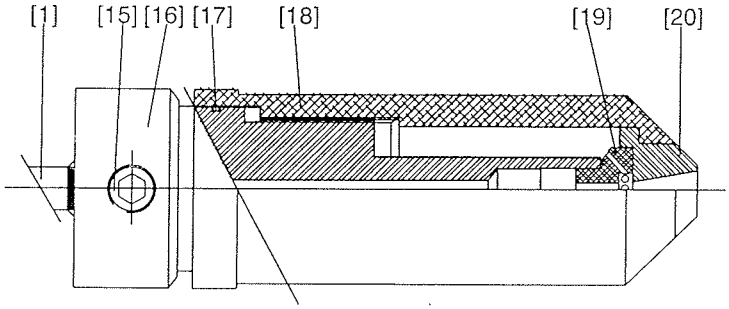


1. Remove burner assembly.
2. Remove nozzle assembly from burner.
3. Remove the 8 M10 bolts holding cone to discharge pipe and remove mixing cone.
4. Replace mixing cone and the 8 M10 bolts properly align mixing cone with discharge pipe putting unit in a vertical position (mixing cone down). Check alignment with water level. Use a torque wrench to 60 Nm to tighten the 8 M10 bolts in the sequence as shown above. Both flanges must be properly aligned.
5. Check gasket of back plate flange. Replace if necessary.
6. Loosen oil nozzle retainer plate, retract nozzle 5 mm (if applicable).
7. Remount nozzle assembly.
8. Leave approx. 2 mm play between back plate and inlet housing to allow proper spring-loading on the scanner and spark ignitor tube.
9. Tighten the 6 M8 bolts to fasten back plate.
10. Reposition **oil nozzle** (if applicable) against the nozzle plate. Tighten retainer plate.
11. Mount burner assembly and reconnect gas/oil supply, spark ignitor, scanner and pilot gas supply.
12. Check on tightness and restart unit.

MAINTENANCE INSTRUCTIONS
PARTS IDENTIFICATION

A. OIL NOZZLE SUB-ASSEMBLY





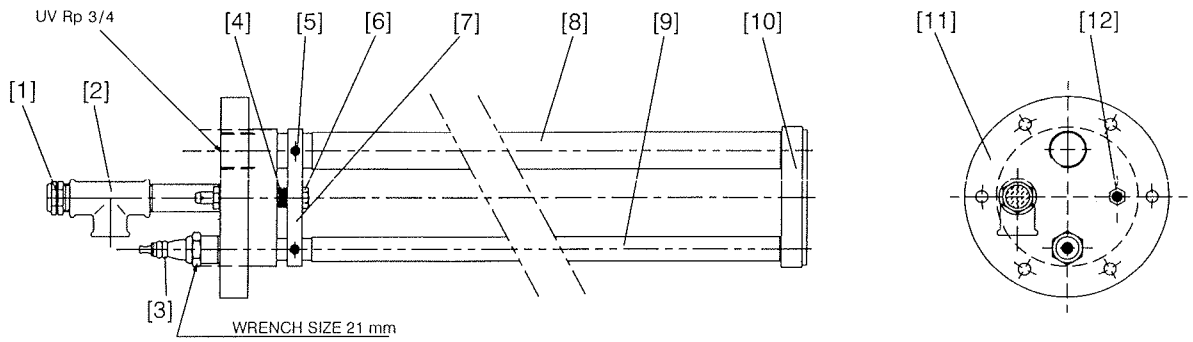
OIL NOZZLE

[1] OIL/ATOMIZING AIR TUBE
[2] PILOT GAS INLET TEE
[3] SPARK IGNITOR
[4] DISC SPRING
[5] HEX SOCKET SET SCREW M6 X 8
[6] HEX HEAD SCREW M6 X 25
[7] TUBE GUIDE
[8] SCANNER TUBE
[9] SPARK IGNITOR TUBE
[10] GAS/OIL NOZZLE
[11] OIL NOZZLE
[12] BACK PLATE
[13] CHEESE HEAD SCREW M6 X 10
[14] O-RING RETAINER PLATE
[15] HOLLOW PLUG 1/8
[16] OIL BODY
[17] O-RING PACKING NO. 034901
[18] OIL CAP
[19] INSERT
[20] NOZZLE

1. Disconnect the oil/pilot gas and compressed air lines at burner.
2. Remove the six bolts M8 holding the back plate to burner.
3. Carefully withdraw the nozzle sub-assembly. Save the gasket.
4. If a new nozzle sub-assembly is to be installed, replace gasket and reverse steps 1, 2 and 3.
5. If the nozzle is to be changed or cleaned, loosen the set screws [5] in tube guide [7] holding the ignition and UV scanner tubes. Loosen cheese head screw [13] and retract nozzle.
6. Unscrew nozzle oil cap [18] from oil body [16]. Be careful not to damage the O-ring [17] or the insert [19].
7. Remove the O-ring [17] and save if undamaged.
8. Clean nozzle and insert. Do not nick or dent the leading edge. Use compressed air/or a solvent to remove all foreign particles. **Do not use an abrasive.**
9. Reinstall O-ring [17], **or replace if damaged** (order no. 034901). Make certain the O-ring is lightly lubricated and inserted on body.
10. Reinstall nozzle oil cap [18] on the body [16]. A drag will be felt when the nozzle contacts O-ring. Continue to screw the nozzle onto the body until insert [19] is contacted. **Do not exceed 17 Nm torque under any circumstances.** (If nozzle is seated too hard on the insert or if oil nozzle does not contact, poor burner performance will result). **Do not use pipe dope, permatex, etc. on threads.**
11. Insert nozzle sub-assembly in burner back plate. Make sure gasket is in place. Reinstall nozzle support, ignition and UV scanner tubes, tighten set screws, reinstall nozzle sub-assembly till nozzle support touches its recess in the cone leaving 2 mm clearance between back plate and burner housing (for spring tension).
12. Reinstall and tighten the six bolts holding back plate in place.
13. Reconnect the oil/pilot gas and compressed air lines.
14. Fire burner and check compressed air pressure and oil flow to ensure that nothing has changed. Following established light-off procedure, check pressures, oil flow, main flame, etc.

MAINTENANCE INSTRUCTIONS
PARTS IDENTIFICATION

B. GAS NOZZLE SUB-ASSEMBLY



[1] SIGHT GLASS NO. 019284
[2] PILOT GAS INLET TEE
[3] SPARK IGNITOR NO. 300244
[4] DISC SPRING 8 X NO. 370146
[5] HEX HEAD SET SCREW M6 X 8
[6] HEX HEAD SCREW M6 X 25
[7] TUBE GUIDE
[8] SCANNER TUBE
[9] SPARK IGNITOR TUBE
[10] GAS NOZZLE 4M = NO. 310309 – 8M = NO. 310323
[11] BACK PLATE NO. 310304
[12] GAS PRESSURE TEST CONNECTION