OPERA
CONDENSING THERMAL GENERATOR FOR LARGE VOLUME OF WATER

ERP

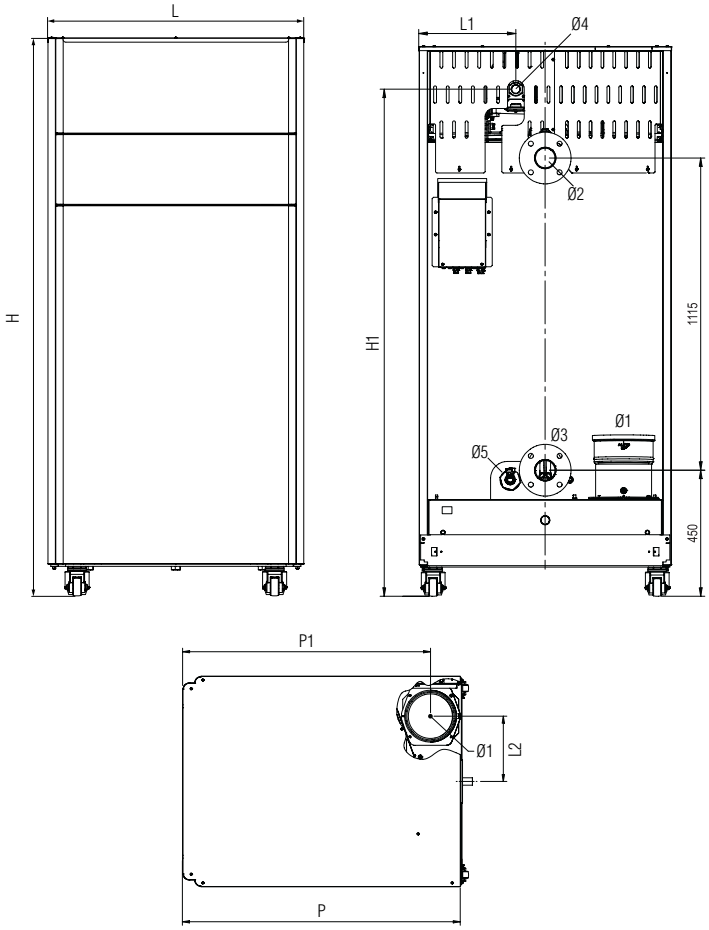
> STRENGTHS:

- **High power condensing thermal module** with **large water content,** designed for single or cascade installations, in combination with a complete range of water, gas and flue gas accessories, up to 1350 kW
- Hydraulic, gas and flue gas accessories for cascade installation with 2 and 3 modules
- Flue gas tube heat exchanger, made with **AISI 316 Ti** stainless steel, with vertical configuration, helical cross-section, set up perpendicularly to the flue gas chamber
- Full pre-mixing combustion unit with metal fibre front combustion burner with very low emissions **(CLASS 6 according to EN 15502-1)**. The modules can run on natural gas and LPG
- The combustion chamber has an extremely contained overall vertical dimension so that the exchange of water/flue gases can take place over the entire extension of the exchanger
- **Generator protection systems:** Double sensor (delivery and return) system for operation at **ΔT constant** / Flue gas safety sensor / Water pressure switch with minimum threshold at 0.8 bar
- Air / Flue gas circuit with intake in the installation site and **check valve integrated on the intake unit** to size the pressurised flue gas manifold
- Control panel protected by a door built into the outer casing with **key lock**
- **Four heavy-duty floating wheels** fitted per standard to facilitate unloading and mobility inside the thermal power plant. Adjustable feet for positioning

> ADVANTAGES OF OPERA:

- It reaches **one of the highest seasonal space** heating efficiencies in its category: **η_s 94%**
- A+ SYSTEM: combined with the modulating remote control and the outdoor probe (optional) it reaches **the top efficiency class A+** (scale from G to A+++)
- The **large volume of water** of the generator allows the boiler to be connected to the system without the need for separating devices and allows for a **very high design Δt**
- Management of the modules in cascade set-up with self-configuring **MASTER / SLAVE system**
- Setting of **switching on and off of generators** (which can be switched on and off in **sequence** or work simultaneously in **parallel**) through the control panel of the MASTER generator
- Electronics on board the machine to manage a **system with two direct zones and one DHW storage** or systems with differentiated temperatures (direct and mixed) in combination with the thermoregulator THETA+
- **RANGE RATED** certified generator to adjust the generated power to the system's needs by increasing the efficiency of the system and preserving the mechanics of the machine
- The modules can be controlled and conducted remotely: Regulation of power or temperature with **0 - 10V signal** / Signalling of block alarm for safety and restoration of operation / **OPENTHERM (OT) and MODBUS** parameterisable communication protocols
- Electronic control of microprocessor combustion allows **1/5 modulation on the single generator and of the 1/20 for the maximum configuration** (3 x 450 modules in cascade set-up)

MODEL			70	125	160	220	320	450
ERP Class		(Class G - A++)	A	ENERGY LABELLING NOT RELEVANT				
Heating heat input	Max / Min	kW	65,5 / 14,0	116,0 / 23,0	150,0 / 41,0	207,0 / 41,0	299,0 / 62,0	420,0 / 80,0
Heat output (80°C / 60°C)	Max / Min	kW	64,4 / 13,7	114,0 / 22,5	147,0 / 40,2	204,0 / 40,2	294,5 / 60,8	412,7 / 78,4
Heat output (50°C / 30°C)	Max / min	kW	69,9 / 15,0	125,0 / 24,8	160,0 / 44,2	220,0 / 44,2	320,0 / 66,8	448,6 / 86,2
Efficiency (80°C / 60°C)	PMax / PMin	%	98,3 / 98,0	98,3 / 98,0	98,4 / 98,0	98,5 / 98,0	98,5 / 98,0	98,3 / 98,0
Efficiency (50°C / 30°C)	PMax / PMin	%	106,8 / 107,7	106,8 / 107,7	106,8 / 107,7	106,8 / 107,7	106,8 / 107,7	106,8 / 107,7
Efficiency	30% partial load	%	109,6	109,6	109,5	109,6	109,6	109,3
NOx emissions class			6	6	6	6	6	6
Max operating pressure	Max / Min	bar	6 / 0,5	6 / 0,5	6 / 0,5	6 / 0,5	6 / 0,5	6 / 0,5
Water content of the generator		litres	160	265	380	380	530	561
Empty weight		Kg	180	280	400	400	500	640
CODE	**NATURAL GAS**		**0RBM4AWA**	**0RBM7AWA**	**0RBM8AWA**	**0RBMAAWA**	**0RBMDAWA**	**0RBMGAWA**



> HYDRAULIC, GAS FITTINGS AND FLUE GAS OUTLETS

MODEL		70	125	160	220	320	450
Ø 1	Flue gas outlet Ø (mm)	80	100	160	160	200	200
Ø 2	System flow	1"1/4	1"1/4	2'	2'	DN65	DN65
Ø 3	System Return	1"1/4	1"1/4	2'	2'	DN65	DN65
Ø 4	Gas inlet	3/4'	1'	1'	1'	1'	1'
Ø 5	Boiler discharge	3/4'	3/4'	3/4'	3/4'	3/4'	3/4'

> HEIGHTS AND DIMENSIONS

ITEMS	L	L1	L2	H	H1	P	P1
	mm	mm	mm	mm	mm	mm	mm
OPERA 70	540	305	210	1883	1815	730	685
OPERA 125	660	390	160	1903	1800	880	810
OPERA 160	780	450	240	1933	1815	1050	950
OPERA 220	780	300	240	1933	1770	1050	950
OPERA 320	900	350	280	1963	1810	1190	1060
OPERA 450	900	345	280	2200	2050	1190	1060

> ACCESSORIES FOR SINGLE INSTALLATIONS

	DESCRIZIONE		CODICE
	motorised valve, 230V - 50Hz powered DN 50 **for mod. 70 and 125**		052000X0
	motorised valve, 230V - 50Hz powered DN 65 **for mod. 160, 220, 320, 450**		052001X0
	outdoor probe		013018X0
	additional sensor for storage tank and/or system flow for cascade configurations with and without hydraulic separator	cable 2 mt	1KWMA11W
		cable 5 m	043005X0

	DESCRIZIONE		CODICE
	500 mm PPS M/F flue gas pipe	100 mm	041072X0
		160 mm	041074X0
		200 mm	041076X0
	1000 mm PPS M/F flue gas pipe	100 mm	041073X0
		160 mm	041018X0
		200 mm	041062X0
	PPS M/F 90° bend	100mm	041077X0
		160 mm	041015X0
		200 mm	041060X0
	neutralisers (see chapter on condensation neutralisers for condensing boilers)		
	Temperature control in chapter **SYSTEM COMPONENTS**		

OPERA INSTALLATION IN A BANK

It is possible to connect in cascade a minimum of two 70 kW generators to a maximum of three 450 kW generators, in the combinations shown in the table.

Every detail of the OPERA range has been designed to simplify cascade installations.

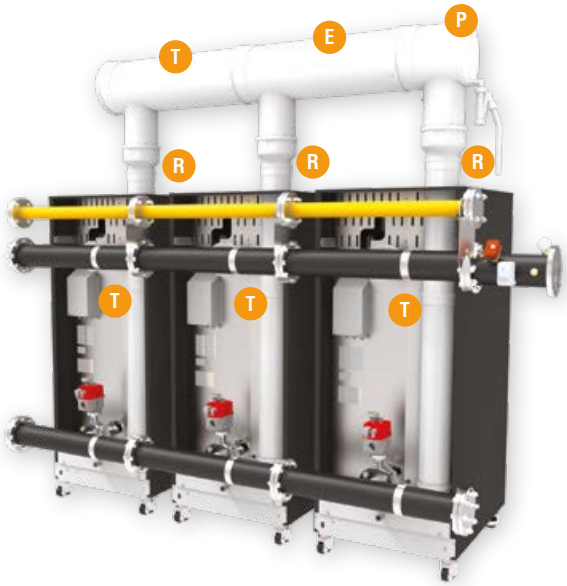
- The hydraulic connections have been positioned at the same heights to simplify connection to the system delivery and return manifolds.
- The satellite flue gas outlet with respect to the generator body and the backflow prevention damper positioned directly on the fan facilitate sizing and implementation of the flue gas manifold (pressurised).
- Coupled with a complete series of accessories for several two or three-generator bank combinations, reaching a maximum output of 1350 kW.
- The electronics fitted as per standard was designed to autonomously manage the dynamics of several generators in cascade, with MASTER-SLAVE logic, up to a max of 6.
- By setting the parameters of the cascade MASTER board, the ignition and shutdown sequence of the various modules can be set and rotated so as to evenly divide the number of operating hours.

BATTERY COMBINATIONS OF 2 GENERATORS				
HEAT OUTPUT (50/30°C)	COMBINATION MODEL		CASCADE MODULATION PMIN/PMAX (50/30°C)	
kW	1°	2°	kW	MODULATION RATIO
139,8	70	70	15,0/139,8	1 / 9
194,9	70	125	15,0 / 194,9	1 / 13
250,0	125	125	24,8 / 250,0	1 / 10
285,0	125	160	24,8 / 285,0	1 / 11
320,0	160	160	44,2 / 320,0	1 / 7
380,0	160	220	44,2 / 380,0	1 / 9
440,0	220	220	44,2 / 440,0	1 / 10
540,0	220	320	44,2 / 540,0	1 / 12
640,0	320	320	66,8 / 640,0	1 / 10
818,6	320	450	66,8 / 768,6	1 / 11
897,2	450	450	86,2 / 897,2	1 / 10

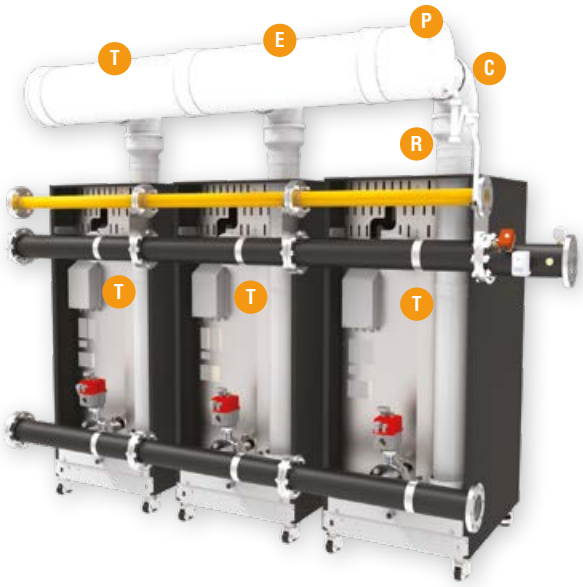
BATTERY COMBINATIONS OF 3 GENERATORS					
HEAT OUTPUT (50/30°C)	COMBINATION MODEL			CASCADE MODULATION PMIN/PMAX (50/30°C)	
kW	1°	2°	3°	kW	MODULATION RATIO
209,7	70	70	70	15,0 / 209,7	1 / 14
264,8	70	70	125	15,0 / 264,8	1 / 18
319,9	70	125	125	15,0 / 319,9	1 / 21
375,0	125	125	125	24,8 / 375,0	1 / 15
410,0	125	125	160	24,8 / 410,0	1 / 16
445,0	125	160	160	24,8 / 445,0	1 / 18
480,0	160	160	160	44,2 / 480,0	1 / 11
540,0	160	160	220	44,2 / 540,0	1 / 12
600,0	160	220	220	44,2 / 600,0	1 / 14
660,0	220	220	220	44,2 / 660,0	1 / 15
760,0	220	220	320	44,2 / 760,0	1 / 17
860,0	220	320	320	44,2 / 860,0	1 / 19
960,0	320	320	320	66,8 / 960,0	1 / 14
1088,6	320	320	450	66,8 / 1088,6	1 / 16
1217,2	320	450	450	66,8 / 1217,2	1 / 18
1345,8	450	450	450	86,2 / 1345,8	1 / 15

OPERA INSTALLATION IN A BANK

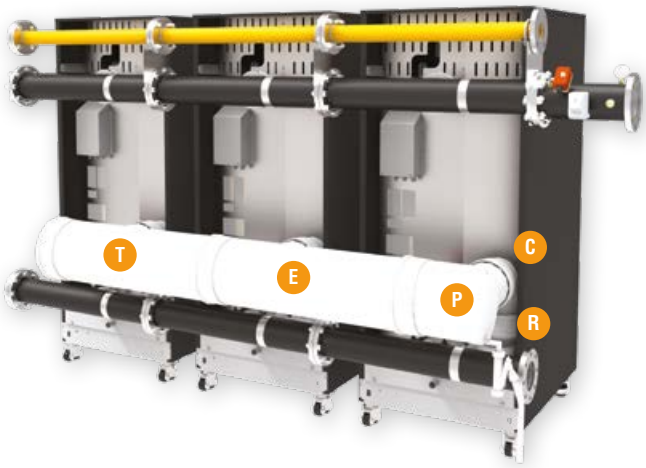
FLUE GAS MANIFOLD HIGH OUTLET



FLUE GAS MANIFOLD MEDIUM OUTLET



FLUE GAS MANIFOLD LOW OUTLET



GAS LINE AND SYSTEM DELIVERY/RETURN MANIFOLDS

> ACCESSORIES ON DEMAND FOR BANK INSTALLATIONS

	DESCRIPTION	CODE
	motorised valve, 230V - 50Hz powered DN 50 **for mod. 70 and 125**	052000X0
	motorised valve, 230V - 50Hz powered DN 65 **for mod. 160, 220, 320, 450**	052001X0
	Temperature control in chapter **SYSTEM COMPONENTS**	

	DESCRIPTION		CODE
	outdoor probe		013018X0
	additional sensor for storage tank and/or system flow for cascade configurations with and without hydraulic separator	cable 2 m	1KWMA11W
		cable 5 m	043005X0
	neutralisers (see chapter on condensation neutralisers for condensing boilers)		

HYDRAULIC AND GAS ACCESSORIES
NECESSARY TO CORRECTLY INSTALL 2 OPERA GENERATORS IN A BANK

					G	G	G	I	I	I	F	F	F	B	B	A	A	A
					1" 1/2 - 1" gas manifold	2" - 1" gas manifold	2" 1/2 - 1" gas manifold	DN50 - 2" hydraulic manifold	DN65 - 2" hydraulic manifold	DN100 - DN65 hydraulic manifold	DN50 flange kit	DN65 flange kit	DN100 flange kit	F-F 1"1/4 coupling	F-F 2" coupling	2" - 1"1/2 M-F reduction nipple	Flange DN50 - sleeve 1"1/4	Flange DN65 - sleeve 2"
HEAT OUTPUT (50/30°C)	MODULES OPERA			COLLECTOR	042050X0	042051X0	042052X0	042053X0	042054X0	042055X0	042059X0	042060X0	042061X0	042062X0	042063X0	042064X0	042065X0	042066X0
	1	2	3		no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.
139,8	70	70	-	Gas	2													
				Mandata				2			1			2				
				Ritorno				2			1						4	
194,9	70	125	-	Gas	2													
				Mandata				2			1			2				
				Ritorno				2			1						4	
250,0	125	125	-	Gas	2													
				Mandata				2			1			2				
				Ritorno				2			1						4	
285,0	125	160	-	Gas		2												
				Mandata					2			1			2	1		
				Ritorno					2			1				1		4
320,0	160	160	-	Gas		2												
				Mandata					2			1			2			
				Ritorno					2			1						4
380,0	160	220	-	Gas		2												
				Mandata					2			1			2			
				Ritorno					2			1						4
440,0	220	220	-	Gas		2												
				Mandata					2			1			2			
				Ritorno					2			1						4
540,0	220	320	-	Gas			2					1						
				Mandata						2			1					1
				Ritorno						2			1					1
640,0	320	320	-	Gas			2					1						
				Mandata						2			1					
				Ritorno						2			1					
818,6	320	450	-	Gas			2					1						
				Mandata						2			1					
				Ritorno						2			1					
897,2	450	450	-	Gas			2					1						
				Mandata						2			1					
				Ritorno						2			1					

HYDRAULIC AND GAS ACCESSORIES
NECESSARY TO CORRECTLY INSTALL 3 OPERA GENERATORS IN A BANK

					G	G	G	I	I	I	F	F	F	B	B	A	A	A
					1" 1/2 - 1" gas manifold	2" - 1" gas manifold	2" 1/2 - 1" gas manifold	DN50 - 2" hydraulic manifold	DN65 - 2" hydraulic manifold	DN100 - DN65 hydraulic manifold	DN50 flange kit	DN65 flange kit	DN100 flange kit	F-F 1"1/4 coupling	F-F 2" coupling	2" - 1"1/2 M-F reduction nipple	Flange DN50 - sleeve 1"1/4	Flange DN65 - sleeve 2"
HEAT OUTPUT (50/30°C)	MODULES OPERA			COLLECTOR	042050X0	042051X0	042052X0	042053X0	042054X0	042055X0	042059X0	042060X0	042061X0	042062X0	042063X0	042064X0	042065X0	042066X0
	1	2	3		no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.
				Gas	3													
209,7	70	70	70	Flow				3			1			3				
				Return				3			1						6	
				Gas	3													
264,8	70	70	125	Flow				3			1			3				
				Return				3			1						6	
				Gas	3													
319,9	70	125	125	Flow				3			1			3				
				Return				3			1						6	
				Gas		3												
375,0	125	125	125	Flow					3			1			3	3		
				Return					3			1				3		6
				Gas		3												
410,0	125	125	160	Flow					3			1			3	2		
				Return					3			1				2		6
				Gas		3												
445,0	125	160	160	Flow					3			1			3	1		
				Return					3			1				1		6
				Gas			3					1						
480,0	160	160	160	Flow						3			1					3
				Return						3			1					3
				Gas			3					1						
540,0	160	160	220	Flow						3			1					3
				Return						3			1					3
				Gas			3					1						
600,0	160	220	220	Flow						3			1					3
				Return						3			1					3
				Gas			3					1						
660,0	220	220	220	Flow						3			1					3
				Return						3			1					3
				Gas			3					1						
760,0	220	220	320	Flow						3			1					2
				Return						3			1					2
				Gas			3					1						
860,0	320	320	220	Flow						3			1					1
				Return						3			1					1
				Gas			3					1						
960,0	320	320	320	Flow						3			1					
				Return						3			1					
				Gas			3					1						
1088,6	320	320	450	Flow						3			1					
				Return						3			1					
				Gas			3					1						
1217,2	320	450	450	Flow						3			1					
				Return						3			1					
				Gas			3					1						
1345,8	450	450	450	Flow						3			1					
				Return						3			1					

FLUE GAS ACCESSORIES
NECESSARY TO CORRECTLY INSTALL 2 OPERA GENERATORS IN A BANK

					P	P	P	E	E	E	T	T	T	T	T	T	C	C	C	R	R	R
					Starting flue gas manifold F 300 mm	Starting flue gas manifold F 200 mm	Starting flue gas manifold F 160 mm	Flue gas manifold F 300 mm	Flue gas manifold F 200 mm	Flue gas manifold F 160 mm	Pipe f 200 M-F L 1000 mm PPS	Pipe f 200 M-F L 500 mm PPS	Pipe f 160 M-F L 1000 mm PPS	Pipe f 160 M-F L 500 mm PPS	Pipe f 100 M-F L 1000 mm PPS	Pipe f 100 M-F L 500 mm PPS	Bend 90° F 200 M-F PPS	Bend 90° F 160 M-F PPS	Bend 90° F 100 M-F PPS	Reduction F 160-200 mm M-F PPS	Reduction F 100-160 mm M-F PPS	Reduction F 80-100 mm M-F PPS
HEAT OUTPUT (50/30°C)	MODULES OPERA			FLUE GAS EJECTION	041070X0	041068X0	041066X0	041071X0	041069X0	041067X0	041062X0	041076X0	041018X0	041074X0	041073X0	041072X0	041060X0	041015X0	041077X0	041080X0	041079X0	041078X0
	1	2	3		no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.
139,8	70	70	-	Low			1			1									2			2
				Medium			1			1					2	2			2			2
				High			1			1					2	2						2
194,9	70	125	-	Low			1			1									2			1
				Medium			1			1					2	2			2			1
				High			1			1					2	2						1
250,0	125	125	-	Low			1			1									2			
				Medium			1			1					2	2			2			
				High			1			1					2	2						
285,0	125	160	-	Low		1			1									2			1	
				Medium		1			1				1	2	1	1		2			1	
				High		1			1				1	2	1	1					1	
320,0	160	160	-	Low		1			1									2				
				Medium		1			1				2	2				2				
				High		1			1				2	2								
380,0	160	220	-	Low		1			1									2				
				Medium		1			1				2	2				2				
				High		1			1				2	2								
440,0	220	220	-	Low		1			1									2				
				Medium		1			1				2	2				2				
				High		1			1				2	2								
540,0	220	320	-	Low	1			1									2			1		
				Medium	1			1			1	1		3			2			1		
				High	1			1			1	1		3						1		
640,0	320	320	-	Low	1			1									2					
				Medium	1			1			2	2					2					
				High	1			1			2	2										
818,6	320	450	-	Low	1			1									2					
				Medium	1			1			4						2					
				High	1			1			4											
897,2	450	450	-	Low	1			1									2					
				Medium	1			1			4	4					2					
				High	1			1			4	4										

FLUE GAS ACCESSORIES
NECESSARY TO CORRECTLY INSTALL 3 OPERA GENERATORS IN A BANK

					P	P	P	E	E	E	T	T	T	T	T	T	C	C	C	R	R	R
					Starting flue gas manifold F 300 mm	Starting flue gas manifold F 200 mm	Starting flue gas manifold F 160 mm	Flue gas manifold F 300 mm	Flue gas manifold F 200 mm	Flue gas manifold F 160 mm	Pipe f 200 M-F L 1000 mm PPS	Pipe f 200 M-F L 500 mm PPS	Pipe f 160 M-F L 1000 mm PPS	Pipe f 160 M-F L 500 mm PPS	Pipe f 100 M-F L 1000 mm PPS	Pipe f 100 M-F L 500 mm PPS	Bend 90° F 200 M-F PPS	Bend 90° F 160 M-F PPS	Bend 90° F 100 M-F PPS	Reduction F 160-200 mm M-F PPS	Reduction F 100-160 mm M-F PPS	Reduction F 80-100 mm M-F PPS
HEAT OUTPUT (50/30°C)	MODULES OPERA			FLUE GAS EJECTION	041070X0	041068X0	041066X0	041071X0	041069X0	041067X0	041062X0	041076X0	041018X0	041074X0	041073X0	041072X0	041060X0	041015X0	041077X0	041080X0	041079X0	041078X0
	1	2	3		no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.
209,7	70	70	70	Low			1			2									3			3
				Medium			1			2					3	3			3			3
				High			1			2					3	3						3
264,8	70	70	125	Low			1			2									3			2
				Medium			1			2					3	3			3			2
				High			1			2					3	3						2
319,9	70	125	125	Low			1			2									3			1
				Medium			1			2					3	3			3			1
				High			1			2					3	3						1
375,0	125	125	125	Low		1			2									3			3	
				Medium		1			2						3	3		3			3	
				High		1			2	2					3	3		0			3	
410,0	125	125	160	Low		1			2									3			2	
				Medium		1			2				1	2	2	2		3			2	
				High		1			2				1	2	2	2					2	
445,0	125	160	160	Low		1			2					2				3			1	
				Medium		1			2				2	4	1	1		3			1	
				High		1			2				2	4	1	1					1	
480,0	160	160	160	Low		1			2									3				
				Medium		1			2				3	3				3				
				High		1			2				3	3								
540,0	160	160	220	Low		1			2									3				
				Medium		1			2				3	3				3				
				High		1			2				3	3								
600,0	160	220	220	Low	1			2									3			3		
				Medium	1			2						9			3			3		
				High	1			2						9						3		
660,0	220	220	220	Low	1			2									3			3		
				Medium	1			2						9			3			3		
				High	1			2						9						3		
760,0	220	220	320	Low	1			2									3			2		
				Medium	1			2			1	1		6			3			2		
				High	1			2			1	1		6						2		
860,0	220	320	320	Low	1			2									3			1		
				Medium	1			2			2	2		3			3			1		
				High	1			2			2	2		3						1		
960,0	320	320	320	Low	1			2									3					
				Medium	1			2			3	3					3					
				High	1			2			3	3										
1088,6	320	320	450	Low	1			2									3					
				Medium	1			2			6	6					3					
				High	1			2			6	6										
1217,2	320	450	450	Low	1			2									3					
				Medium	1			2			6	6					3					
				High	1			2			6	6										
1345,8	450	450	450	Low	1			2									3					
				Medium	1			2			6	6					3					
				High	1			2			6	6										