



Combined Heat & Power Solutions

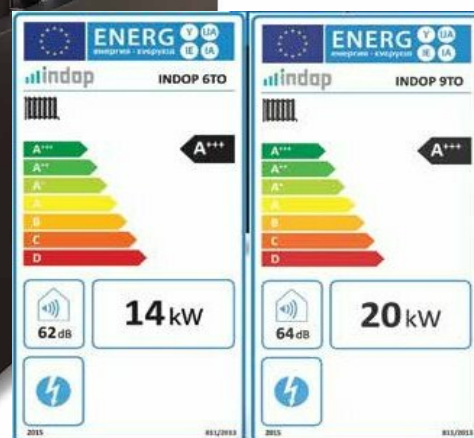


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INDOP 9T0

Modulation	66%	100%
Electrical Output	6	9 kWe
Thermal Output	13.9	19.7 kWth
Energy input	21.4	30.8 kW
Engine type - TOYOTA 1KS		
Cylinders - 3		
Displacement 953 ccm		
Electrical Eff	28.1	29.2 %
Thermal Eff	65.0	64.0 %
Total Efficiency	93.1	93.2 %
Seasonal Efficiency		166 %
Output flow Temp		85-90
Return Temp		35-70
CO		< 75
NOx		< 42 mg/Nm
-		64
SPL		48 dB(A)@1M
Weight (inc oil & coolant		600 kgs
1200mm x 800mm x 1170mm		
Fuel - Natural Gas / LPG		
Service interval 8000 hrs		



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TECHNICAL SPECIFICATION FOR INDOP 9 kW_e CHP UNIT



TECHNICAL DATA FOR UNIT	EM	9KW	
		100%	66%
Energy input	kW	30,8	21,4
Gas consumption	Nm ³ /h	3,1	2,1
Electric power	kW _{el.}	9	6
Power factor	λ	0,96-0,98	
Thermal power	kW	19,8	13,9
Electric efficiency	%	29,2	28,1
Thermal efficiency	%	64	65
Total efficiency	%	93,2	93,1
Seasonal space heating energy efficiency	%	166	
Sound power	dB	64	
Sound pressure	dB	53	
Thermal circuit			
Flow temperature	°C	85–90	
Return temperature	°C	35–70	
Minimum flow rate of medium	l/min	14,5	
Minimum flow rate of medium	m ³ /h	0,87	
Basic dimensions and mass of INDOP CHP unit (no handles, compensation or attachments)			
Length	mm	1202	
Width	mm	800	
Height	mm	1170	

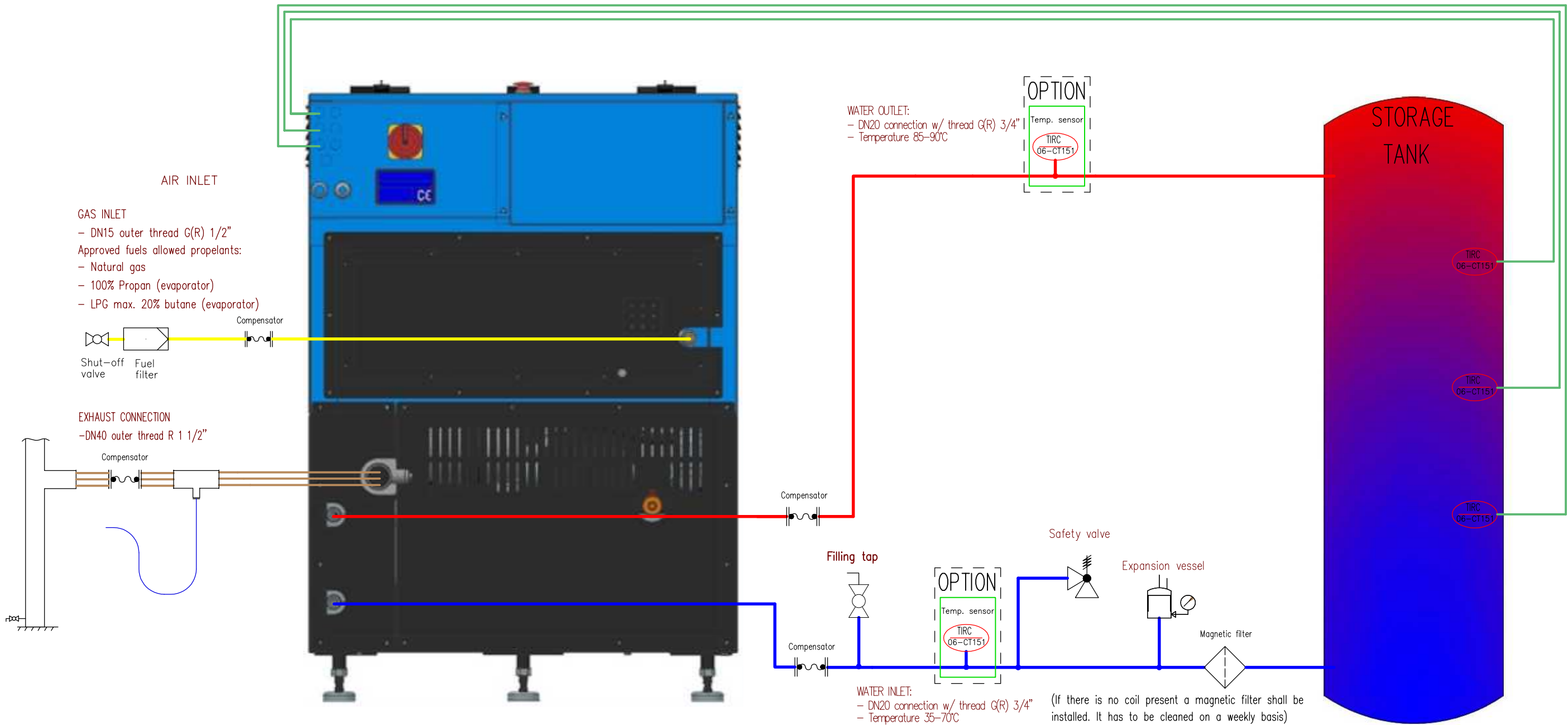
Weight	kg	600
Technical data - engine		
Manufacturer		TOYOTA 1KS
Engine type		L
Operating mode		4-Takt Otto
Configuration		R
Number of cylinders		3
Cylinder diameter	mm	72
Engine stroke	mm	78
Volume	cm ³	953
Nominal speed	RPM	1500
Length	mm	489
Width	mm	399
Height	mm	651
Net weight	kg	73,5
Lubricating oil consumption	kg/h	0,003
Compression ratio	ε	12
Oil volume in the engine max/min	l	15/1,8
Oil tank volume	l	10
Engine fuel pressure	mbar	20-50
Technical data - alternator		
Frequency	Hz	50
Voltage	V	400
Power	kVA	11,5
Power factor	λ	0,76
Revolutions per minute	RPM	1500
Thermal energy balance		
Energy input	kW	30,9
Cooling water	kW	14,2
Flue gases	kW	5,6
Flue gas		
Flue gases temperature with full load	°C	110-120
Flue gases mass flow rate - wet	kg/h	44,6
Maximum pressure drop of flue gases	mbar	20
Air combustion data		
Combustion air mass flow	kg/h	35

Table 6: Technical data for INDOP CHP unit

Consumption of natural gas with H_u_{36} MJ/Nm³ in standard conditions: 15 °C; 101,325 kPa. Basic technical data apply for standard conditions in accordance with specification. The defined technical data are based on standard conditions according to EN 50465:2015. Any deviations from the standard conditions can cause changes in the value of thermal data and should be taken into account when designing the thermal cycle equipment. When defining dimensions of the thermal cycle equipment, it is recommended to take into account the thermal power tolerance of $\pm 8\%$, and additional 10% reserve. Electric power $\pm 5\%$.

NOTE:
- Not all component parts on the drawing are included in the scope of supply of INDOP d.o.o.
- The scope of supply is defined in the agreement made between INDOP d.o.o. and the customer!
- We reserve the right to modifications in view of advanced technical solutions.

- Storage tank shall be minimum 800 l
- If there is a coil in the storage tank, the heat transfer must be 21(15) kW, at T3 max 65°C



Stopnja zaupnosti/Degree of Confidentiality:			
Izdelal/Designed by: Funkl A.	Pregledal/Reviewed by: Koradej M.	Tehnolog 1/Technologist 1:	Tehnolog KK/Technologist QA:
Spremenil/Changed by:	Odobril/Approved by: Koradej M.	Tehnolog 2/Technologist 2:	Standardizer:
Material:		Povrsinska zascita/Surface Treatment:	
Standard:		Standard:	
Tehnicni predpis/Technical Rules:		Tolerance prostih mer/General Tolerances:	
Klasifikacija risbe/Classification of the Drawing:		Merilo/Scale:	List/listov/Sheet/Sheets:
Naziv:		Stevilka dokumenta:	
indop		CONNECTION SCHEME CHP INDOP 9(6)TO 1x INDOP CHP UNIT & 1x STORAGE TANK	
		Datum izdaje/Date of Issue: 22.8.2017	
		Stevilka nacrtu: 682458	
		Verzija/Version: REV: 0	