



Combined Heat & Power Solutions

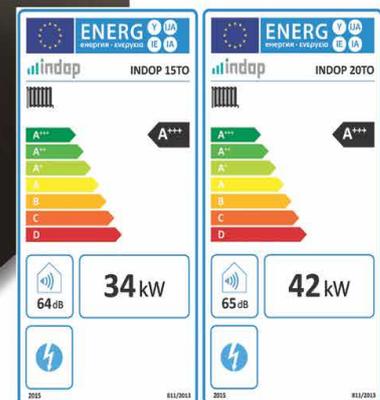


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INDOP 15TO

Modulation	66%	100%
Electrical Output	10	15 kWe
Thermal Output	23	34 kWth
Energy input	34.3	50.3 kW
Engine type - TOYOTA 4KY		
Cylinders - 4		
Displacement 2237 ccm		
Electrical Eff	29.2	30.0 %
Thermal Eff	67.0	67.6 %
Total Efficiency	96.2	97.6 %
Seasonal Efficiency		184 %
Output flow Temp	85-90	
Return Temp	35-70	
CO	< 55	
NOx	< 28 mg/Nm	
-	64	
SPL	49 dB(A)@1M	
Weight (inc oil & coolant)	800 kgs	
1491mm x 800mm x 1266mm		
Fuel - Natural Gas / LPG		
Service interval 8000 hrs		

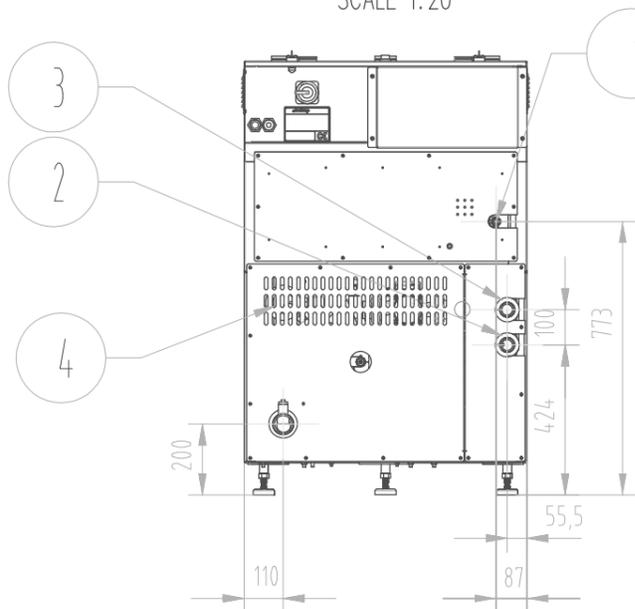


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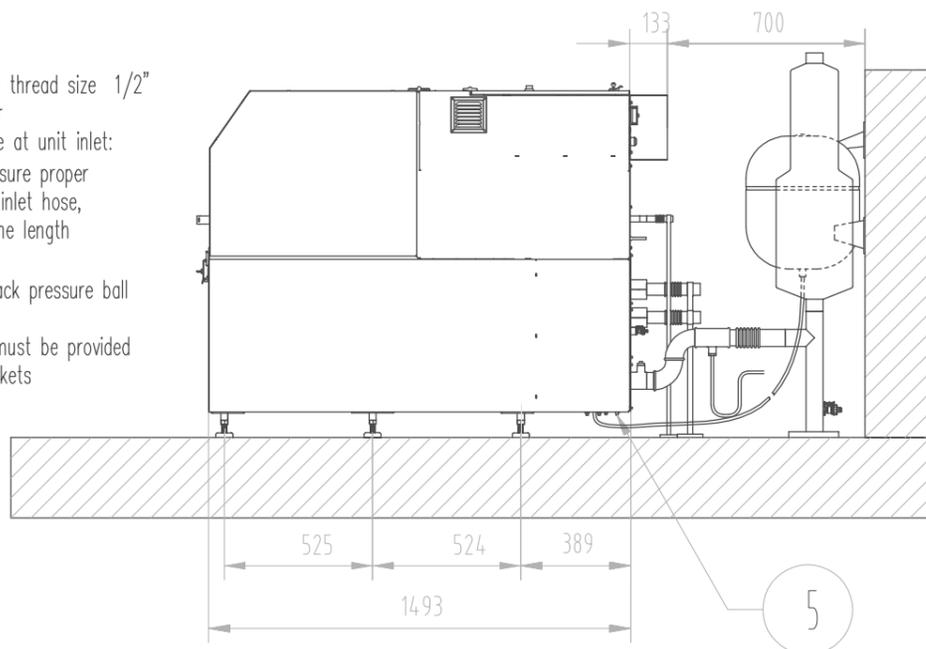
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SCALE 1:20



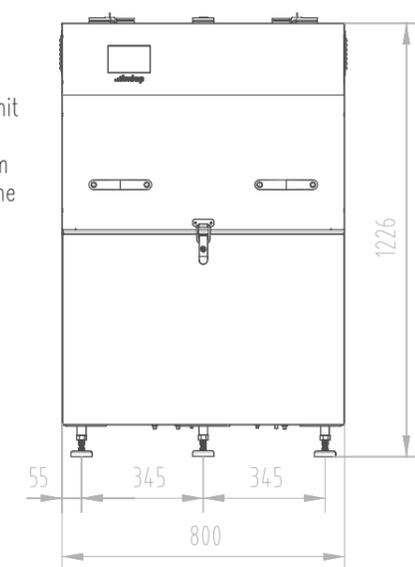
- FUEL:**
- Natural gas
 - Connection DN15 with thread size 1/2"
 - Required compensator
 - Required gas pressure at unit inlet: $p = 20-50$ mbar (assure proper cross-section of the inlet hose, taking into account the length of the pipeline)
 - Required filter and back pressure ball valve
 - Pipeline to the unit must be provided with own holding brackets



FLUE GASES

- Connection DN50 with thread size R 2"
- Temperature of exhaust gas is 110 °C
- Required compensator
- Maximum permissible pressure drop for unit is 20 mbar
- Assure proper outlet of condensation from the attached smokestack to make sure the condensate cannot run back to the unit
- The smokestack must be provided with own support holders
- Provide isolation for exhaust pipe
- Rain or other fluids shall not enter flue

SCALE 1:20

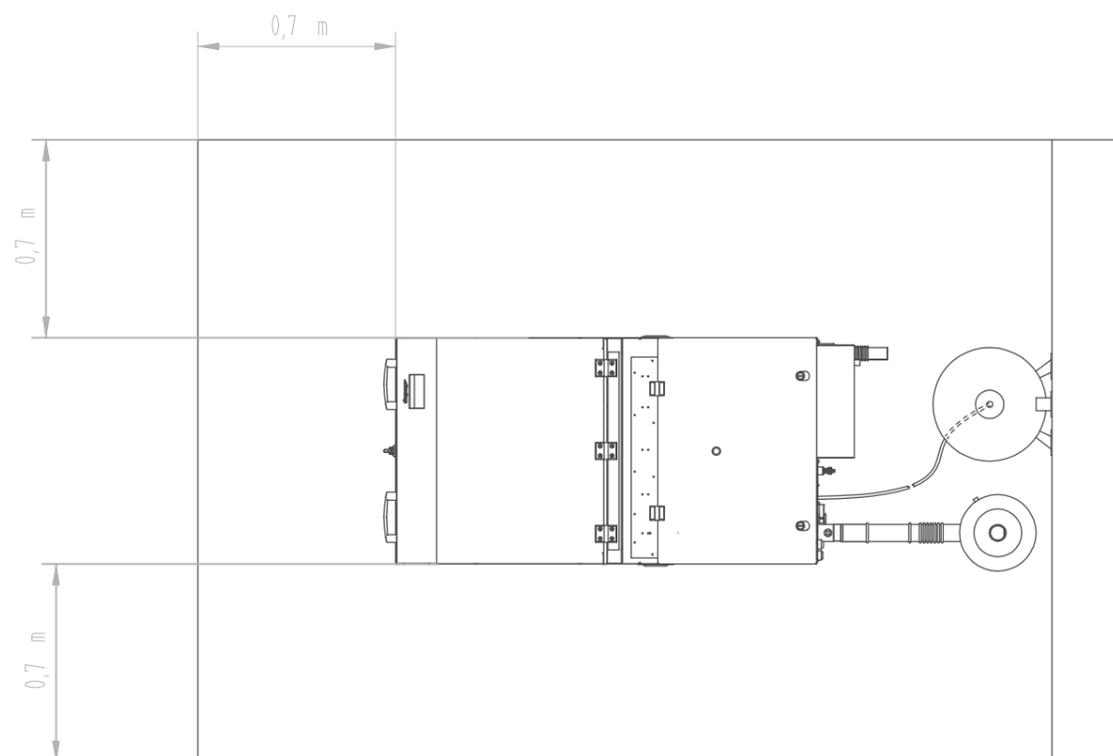


AIR INTAKE

- Assure proper intake of fresh air into the unit
- Flow rate 80 m³/h

CONNECTION OF COOLING MEDIUM:

- DN32 pipes, G 1 1/4"
- Required compensator
- Required expansion vessel, feeding valve and relief valve
- Pipeline to the unit must be provided with own holding brackets
- Permissible pressure drop is 0.2 bar



PLACING OF UNIT:

- The foundations must comply with construction requirements for CHP unit, carried out by the project planner
- The floor must have proper load bearing capacity, must be hard, clean and levelled
- The room height shall be min 2.2 m
- The unit must be properly grounded

NOTE:

- This drawing is symbolic and shows installation of the unit
- 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

TECHNICAL DATA FOR UNIT		
UNIT TYPE	INDOP 20TO	INDOP 15TO
ENGINE	TOYOTA 4Y	TOYOTA 4Y
ELECTRIC POWER	20 kW	15 kW
THERMAL POWER	43,5 kW	34,7 kW
INPUT POWER	66,7 kW	51,7 kW

		15 kW	20 kW
With use of glycol/water mixture 25/75 %	Pressure	min 1 bar max 6 bar	min 1 bar max 6 bar
	Pressure	from 0,7 m ³ /h to 1,4 m ³ /h	from 1,6 m ³ /h to 2,1 m ³ /h
With use of water	Pressure	min 1 bar max 6 bar	min 1 bar max 6 bar
	Pressure	from 0,6 m ³ /h to 1,3 m ³ /h	from 1,5 m ³ /h to 2,1 m ³ /h

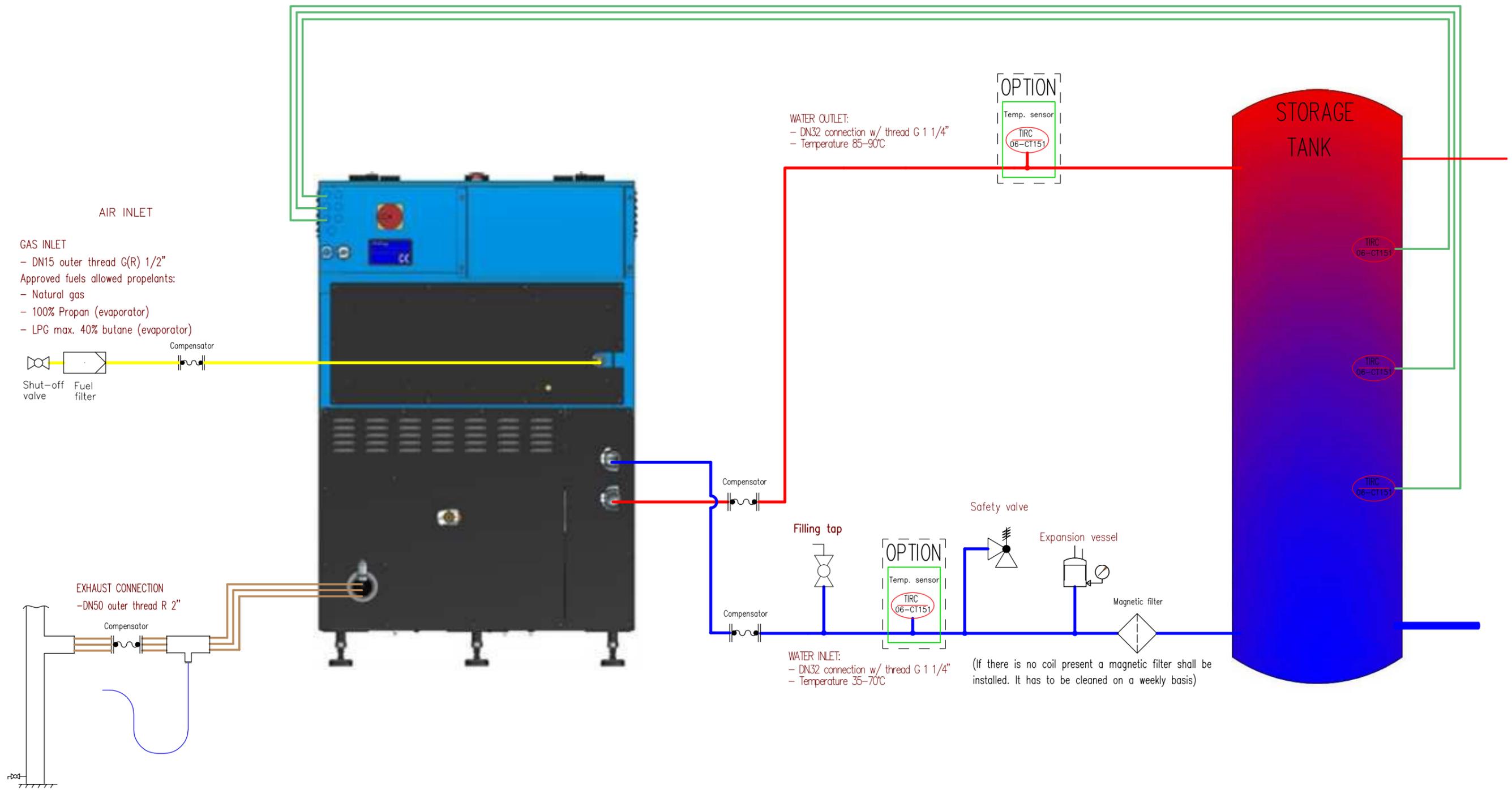
POS.	TITLE	QUA.
5	EARTHING	1
4	EXHAUST DN50	1
3	WATER RETURN DN32	1
2	WATER FLOW DN32	1
1	GAS CONNECTION DN15 20-50 mbar	1

Flue gas flow (Natural gas)	15 kW	20 kW
Dry [kg/h]	~ 64,7	~ 83,5

Stopnja zaupnosti/Degree of Confidentiality:			
Izdelal/Designed by: Zdovc G. Spremenil/Changed by: Podkoritnik T.	Pregledal/Reviewed by: Pavlovič D. Odobril/Approved by: Koradej M.	Tehnolog 1/Technologist 1: Tehnolog 2/Technologist 2:	Tehnolog KK/Technologist QA: Standardizer:
Material: Standard:	Povrsinska zascita/Surface Treatment: Standard:		Ident. stev./Item ID: XLS TABELA/XLS TABLE
Tehnicni predpis/Technical Rules:		Tolerance prostih mer/General Tolerances:	Dimenzije/Dimensions: Masa/Weight (kg):
Klasifikacija risbe/Classification of the Drawing:		Merilo/Scale: 1 : 25	List/listov/Sheet/Sheets: Datum izdaje/Date of Issue: 7.12.2016
Naziv: Installation and connection of CHP INDOP 20TO and CHP INDOP 15TO			Stevilka nacрта: KO-002001 Stevilka dokumenta: P0020EN-2 Verzija/Version: REV: E

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 1000 l
 - If there is a coil in the storage tank, the heat transfer must be 45(35) kW, at T3 max 65°C



Legend:

	Shut-off valve		Connection
	Safety valve		Filling tap
	Compensator		Expansion vessel
	Temperature sensor		Filter

CHP UNIT DATA		
Electric power	20(15)	kWe
Thermal power	41,9(34)	kW
Input power	64,8(50,3)	kW

- Temperature signal from storage tank
- Water flow to the user
- Water flow from the user
- Exhaust gas flow
- Gas inlet into the system

Stopnja zaupnosti/Degree of Confidentiality:			
Izdelal/Designed by: Funkl A.	Pregledal/Reviewed by: Koradej M.	Tehnolog 1/Technologist 1:	Tehnolog KK/Tehnologist QA:
Spremenil/Changed by:	Odobril/Approved by: Koradej M.	Tehnolog 2/Technologist 2:	Standardizer:
Material:	Povrsinska zascita/Surface Treatment:		Dimenzije/Dimensions:
Standard:	Standard:		Masa/Weight (kg):
Tehnicni predpis/Technical Rules:		Tolerance prostih mer/General Tolerances:	
Klasifikacija risbe/Classification of the Drawing:		Merilo/Scale:	List/listov/Sheet/Sheets:
		Naziv:	
		CONNECTION SCHEME CHP INDOP 20(15) TO 1x INDOP CHP UNIT & 1x STORAGE TANK	
Datum izdaje/Date of Issue: 24.8.2017			Stevilka nacrt: 682457
Stevilka dokumenta: P682457-3EN			Verzija/Version: REV: 0