



UNIDO ATMOsphere Technology Summit- Natural Solutions for Developing Countries

**FIELD CASES
WITH NATURAL REFRIGERANTS
IN DEVELOPING COUNTRIES**

MYCOM Compressor and Development



1924: Piston Compressor



1964: Screw Compressor



1978: 4°K Super Low temp. Particle Accelerator (Helium)



1981: Nuclear Fusion (Helium)



1984: Mag-Levi Train (Helium)



1989: Rocket Fuel (Hydrogen)



1993: Super GE (Superconduct-EL-Generator)



1958: Multi-Cylinder Piston Compressor



Ethylene Plant



LNG/LPG Tanker



Organic (EOEG)



Inorganic: (NH₃)



Pharma Plant

1924

1960

1970

1980

1985

1990

● More than 100.000 Screw and Piston Compressors have been installed over 100 countries.

CRYO-NUCLEAR-TECHNOLOGY

CERN, Genf, CH





PETROCHEMICAL



FIELD CASES

WITH NATURAL REFRIGERANTS IN DEVELOPING COUNTRIES

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**MYCOM COMPRESSORS : SERBIA - CROATIA – BOSNIA HERZEGOVINA –
RUSSIA - EGYPT**Cooling Plants:

Number of constructed facilities	36
Total storage capacity	136.500 ton
Total number of continuous freezing tunnels	38
Total capacity of continuous tunnels (2,5 t/h – 7,0 t/h)	140,5 t/h
Number of installed compressors “Mayekawa – Mycom”	92
Time period of compressors' installation	1976 – 2013
Compressor models	
Piston: N6K, N8K, N6WB, F4.2WA	2, 1, 2, 1 = 6 pcs
Screw: N160, N200, N250, N320, FM160, F200	5, 30, 39, 5, 5, 2 = 86 pcs
Electrical motor power	37 – 450 kW
Compressor with the highest number of working hours	162.000 h

Cooling plant 2012
"Fathalla Compound"
Alexandria - Egypt









N250VLD
TE/TC=-40/+35° C
RT/BKW=456/290kW
(477/256 Kw)

N200VLD-HE
TE/TC=-10/+35° C
RT/BKW=818/220kW
(850/203kW)
(-40/+35° C)

LP RECEIVER

MP RECEIVER

HP RECEIVER

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MYCOM COMPRESSORS : SERBIA – MACEDONIA - CROATIAMeat industries:

Number of meat industries	12
Total annual production of meat and meat products	9.940 t / month
Number of installed compressors “Mayekawa – Mycom”	45
Time period of compressors' installation	1987 – 2013
Compressor models	
Piston: N4WB, N6A, N8K	1, 2, 2 = 5 pcs
Screw: N160, N200, N250, FM160	11, 13, 7, 9 = 40 pcs
Electrical motor power	37 – 400 kW
Compressor with the highest number of working hours	135.000 h



1987

Meat industry
"Yuhor export"
Jagodina, Serbia



1987

N250LUD -10/+35° C

RT/BKW=1608/390kW

N200MUD RT/BKW=682/171kW

N160SUD-LB -42(-30)/-10° C RT/BKW=108/30kW

N160LUD-LB (") RT/BKW=205/60kW

N4WB

135.000 HRS

MAYEKAWA

MAYEKAWA Europe nv/sa

DOC.2013-539 Vienna



2006

FM160L TE/TC=-10/+35° C

RT/BKW=410/104kW

MYCOM COMPRESSORS : SERBIA – BOSNIE HERZEGOVINA - SLOVENIA

Other industries:

Number of industries	11
Number of installed compressors “Mayekawa – Mycom”	24
Time period of compressors' installation	1988 – 2010
Compressor models	1 = 1 pcs 3, 8, 6, 6 = 23 pcs
Piston: N6HK Screw: N160, N200, N250, FM160	
Electrical motor power	90 – 355 kW
Compressor with the highest number of working hours	115.600 h
A) Wine and soft drinks production B) Production of fruit concentrates C) Motor oil refineries D) Production of edible oil and vegetable fats E) Dairies F) Production of technical gases G) Production of lyophilized fruit and vegetables H) Heat pumps	

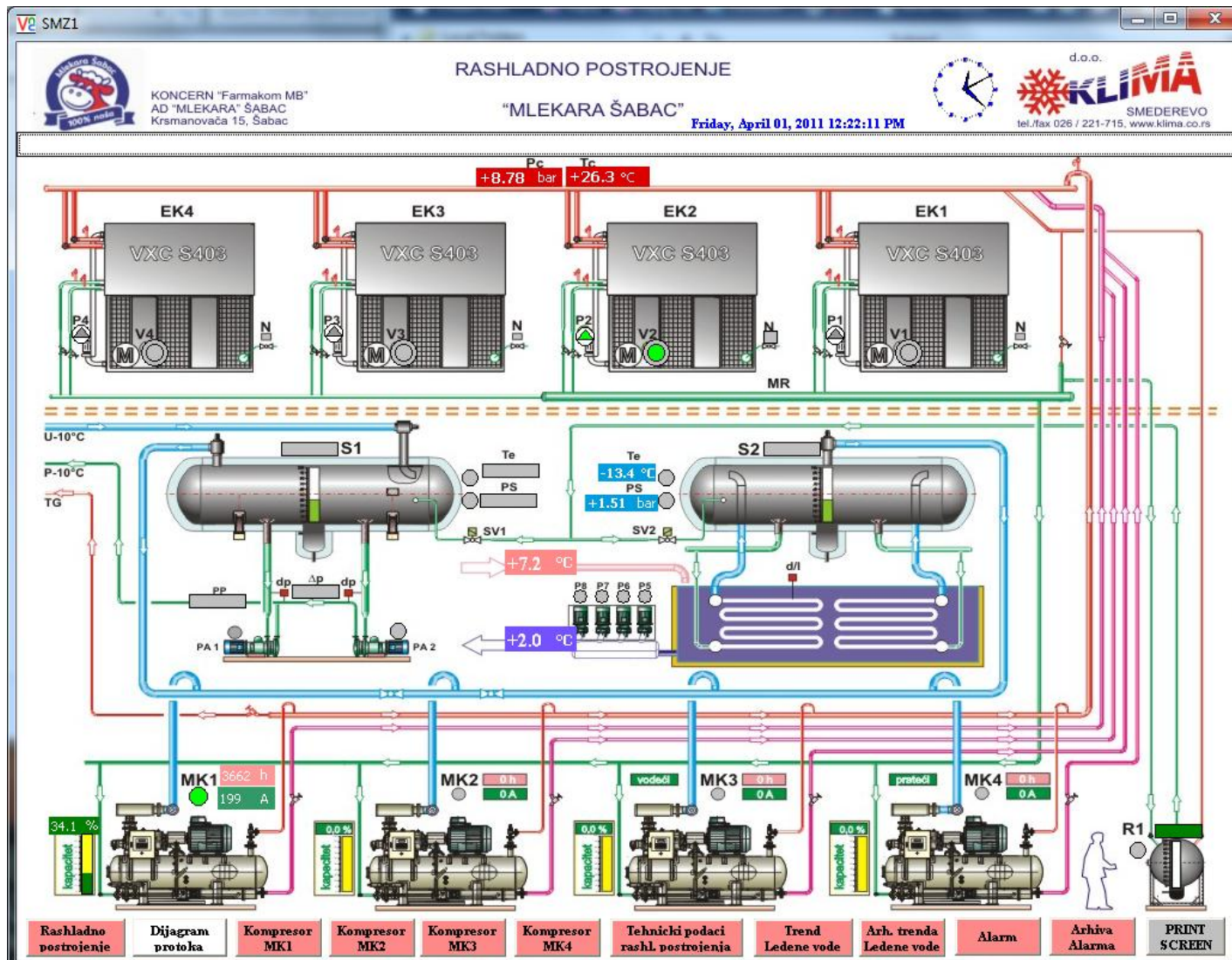
Dairy
"Mlekara Šabac"
Šabac , Serbia





2010
N200VLD 15000hrs
TE:TC=-10/+35° C
RT/BKW=818/220kW
(850/203kW)





MYCOM COMPRESSORS : SERBIA - MACEDONIABreweries:

Number of breweries	8
Total annual production of beer	7.200.000 hl/year
Number of installed compressors "Mayekawa – Mycom"	19
Time period of compressors' installation	1988 – 2012
Compressor models	
Piston: -	0 = 0 pcs
Screw: N200, N250, FM160	6, 11, 2 = 19 pcs
Electrical motor power	132 – 450 kW
Total cooling capacity of all compressors at operating conditions -10°C/+35°C	18.650 kW
Compressor with the highest number of working hours	128.000 h



Brewery 1994 / 2000
"Carlsberg" Čelarevo, Serbia



3x N250SUD 1994
1 x N250VSD 2000
TE/TC=-8/+35° C
RT/BKW=1162/272kW
(1205/245kW)

128.000 HRS

ENERGY SAVING REALISED CARLSBERG :

REDUCING THE CONDENSING PRESSURE FROM
35° C (12,5 barg) to 29° C (10,3 barg)

PER COMPRESSOR :

CAPACITY INCREASE OF 43kW (1205-1162) (4%)

POWER DECREASE OF 27kW (272-245) (10%)

COP-C INCREASE OF 0,63 (15%)

OBTAINED COMPRESSOR-POWER SAVING ON 7000 HRS(80% YR) :

$27 \times 4 \times 7000 = 756.000 \text{ kWh}$

At electricity cost price of 0,045 €/kWh

34.020 €/year

OBTAINED CONDENSOR-POWER SAVING ON 7000 HRS/YR(80% YR) :

$28,1 \times 4 \times 7000 = 786.800 \text{ kWh}$

or 35.406 €/year (0,045 €/kWh)

Automatic operation of two Evaporative condensers with Dahlander motor (two speed)

EC1, EC2 - Evaporative condenser Baltimore VXC S350 with two speed Dahlander motor (30/7,5 kW)

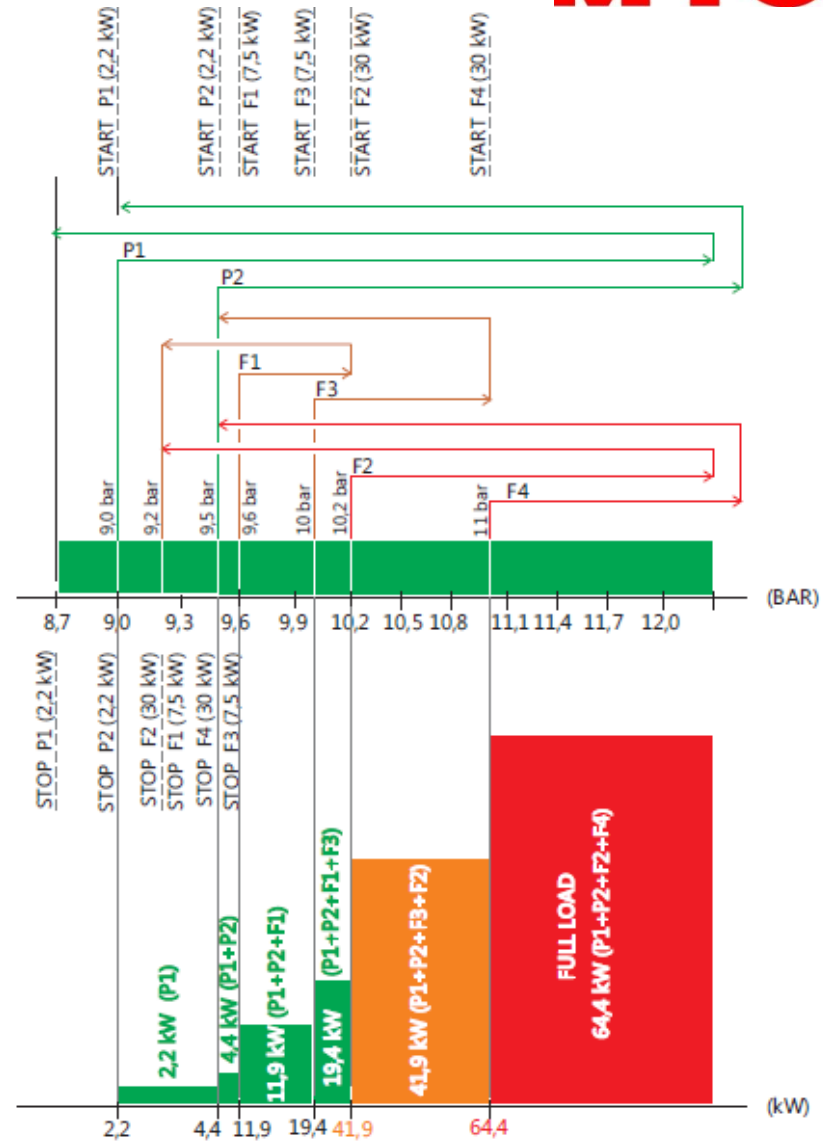
Condensing capacity $Q = 2 \times 1160 \text{ kW}$
 $T_c/T_{wb,t} = +35^\circ\text{C}/+24^\circ\text{C}$

EC1

P1 - Water pump;
 F1 - Fan motor I speed (7,5 kW);
 F2 - Fan motor II speed (30 kW)

EC2

P2 - Water pump;
 F3 - Fan motor I speed (7,5 kW);
 F4 - Fan motor II speed (30 kW)



ENERGY SAVING

THE PLANTS ARE DESIGNED FOR OPTIMAL ENERGY SAVING NOT ONLY FOR CONDENSOR BUT ALSO COMPRESSOR OPERATING AT MUCH REDUCED CONDENSING PRESSURE FOR THE MAJORITY OF THE OPERATION PERIOD

THE DIAGRAM SHOWS THAT ALTHOUGH DESIGN PRESSURE IS AT 12,5 BARG, COMPRESSOR WILL OPERATE FOR 80% BELOW 10,2 BARG RESULTING IN A DRASTIC SAVING OF ENERGY AS INDICATED ON EACH OF THE SHOWN FIELD CASES.

**THANKS FOR YOUR
ATTENTION!**

MAYEKAWA Global Network

Over 70,000 Screw and Piston compressors running in more than 100 countries.



Worldwide:

- 33 countries / 119 offices
- 8 production plants

MAYEKAWA Europe Organization

MAYEKAWA Europe nv/sa

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