

ENERGY SAVINGS



Frequency Controlled Secondary Heating Pumps

Intelligent engineering
for future generations.



Siempelkamp

Logistics & Service

Features

Frequency Controlled Heating Pumps



ENERGY SAVINGS

OPTIMIZED ENERGY EFFICIENCY FOR A POSITIVE
BALANCE



- Eco upgrade package for saving energy and money
- Typical return of invest < 2 year
- Typical energy saving up to 30% - 50%

Example Power and Cost Savings Frequency Controlled Heating Pumps



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- Availability of sufficient heat energy
- Constant pump rotation
→ no adjustment to real necessary heat demand
- Very low temperature difference inlet – return
→ high flow rate of heat transfer oil

High Energy Consumption → High Potential for Savings

Our Solution → Frequency Controlled Heating Pumps



$P_{el} \sim (V)^3$ (electrical power depends on flow rate)

Reduction of flow rate by 20%

$$P_{el} \sim (0,8)^3 \sim 0,51 \quad \rightarrow \text{(approx. 50\% power saving possible)}$$

Reduction of flow rate by 30%

$$P_{el} \sim (0,7)^3 \sim 0,34 \quad \rightarrow \text{(approx. 65\% power saving possible)}$$

Example Power and Cost Savings Frequency Controlled Heating Pumps



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	HC 5	HC 4	HC 3	HC 2	HC 1	Σ
ΔT_{act}	6.7° C	4.3° C	2.0° C	2.6° C	4.6° C	
P_{act}	15.0 kW	18.8 kW	53.5 kW	171.8 kW	43.2 kW	302.4 kW
ΔT_{new}	10.0° C	7.4° C	2.9° C	3.8° C	5.0° C	↑ difference ↓
P_{new}	1.3 kW	2.6 kW	21.2 kW	53.5 kW	10.1 kW	

Result:

= > approx. 200 kW potential for savings!!!!

= > approx. 130 T€ p.a. savings (9 ct. / kWh)

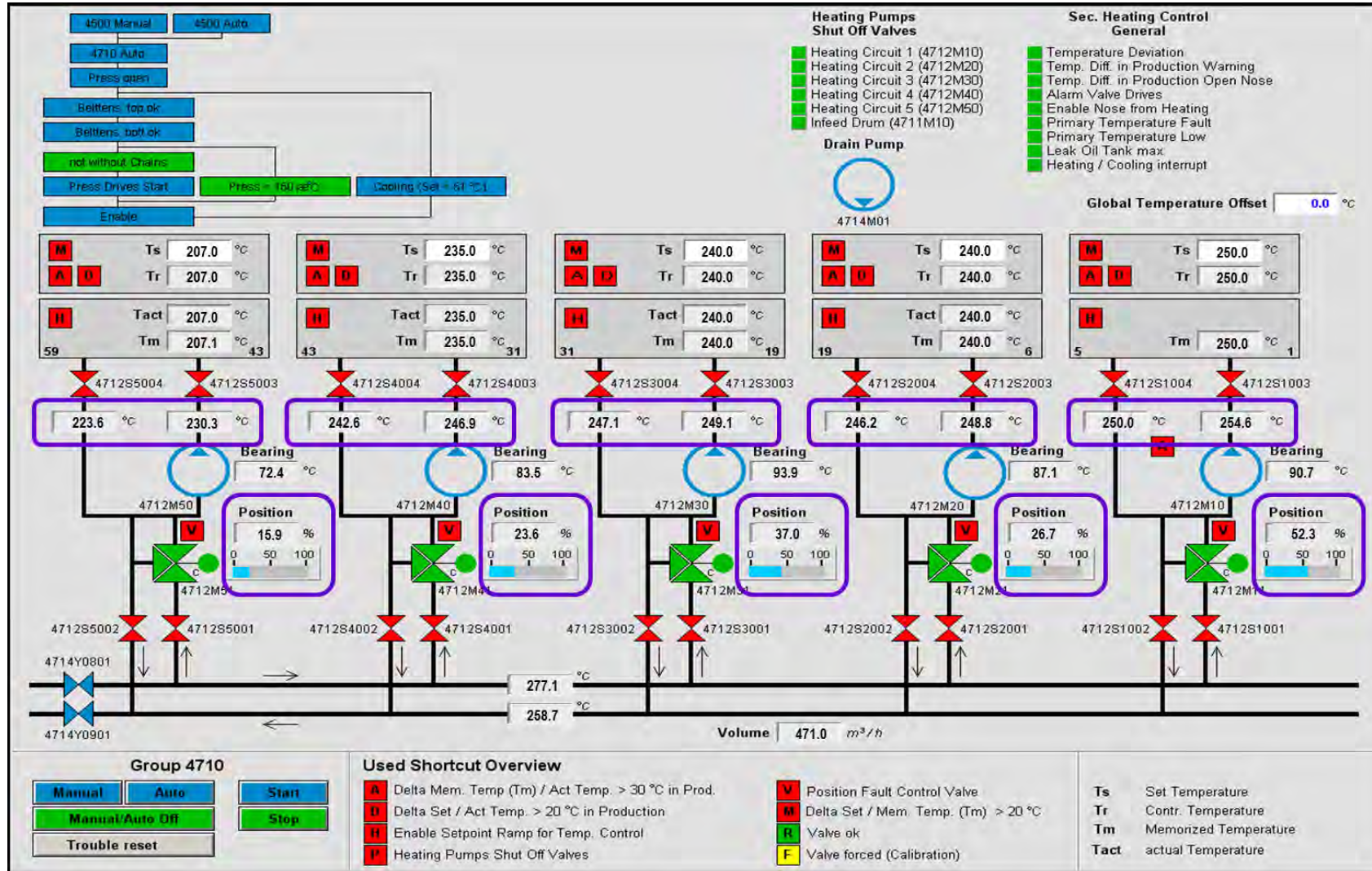
Existing Heating Circuit Overview

Frequency Controlled Heating Pumps



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Heating Circuit Overview After Upgrade Frequency Controlled Heating Pumps



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OPC-Connection SPC
Press Heating

Backward Forward Navigator Alarms Print Language Label 47731 Legend Help Log In Quit A0831 v1BN C2C01025 (c) Siempelkamp 2006

4500 Manual 4500 Auto
4710 Auto
Press open
Batteries_top ok
Batteries_batt ok
not without chains
Press Drive Start
Press Stop
Enable

Drain Pump 4715M01

Heating Pumps Shut Off Valves
 Heating Circuit 1 (4712M10)
 Heating Circuit 2 (4712M20)
 Heating Circuit 3 (4712M30)
 Heating Circuit 4 (4712M40)
 Heating Circuit 5 (4712M50)

Sec. Heating Control General
 Temperature Deviation
 Temp. Diff. in Production Warning
 Temp. Diff. in Production Open Nose
 Alarm Valve Drives
 Enable Nose from Heating
 Primary Temperature Fault
 Primary Temperature Low
 Leak Oil Tank max
 Heating / Cooling interrupt

Global Temperature Offset 0.0 °C

Unit	Fs [Hz]	ΔTs [°C]	Fr [Hz]	ΔTr [°C]	Ts [°C]	Tr [°C]	Tact [°C]	Tm [°C]	Bearing [°C]	Position [%]	Freq. [Hz]
59	36	9.0	0	0.0	205.0	0.0	0.0	0.0	0.0	0.0	32
43	35	8.0	0	0.0	204.0	0.0	0.0	0.0	0.0	100.0	32
31	34	7.0	0	0.0	203.0	0.0	0.0	0.0	0.0	100.0	32
18	33	6.0	0	0.0	202.0	0.0	0.0	0.0	0.0	100.0	32
5	32	5.0	0	0.0	201.0	0.0	0.0	0.0	0.0	100.0	48

4712S5004 4712S5003 4712S4004 4712S4003 4712S3004 4712S3003 4712S2004 4712S2003 4712S1004 4712S1003

4712M50 4712M40 4712M30 4712M20 4712M10

4712M51 4712M41 4712M31 4712M21 4712M11

4712S5002 4712S5001 4712S4002 4712S4001 4712S3002 4712S3001 4712S2002 4712S2001 4712S1002 4712S1001

4714Y0801 4714Y0901

Volume 0.0 m³/h

Group 4710
 Manual Auto Start
 Manual/Auto Off Stop
 Alarm reset

Used Shortcut Overview
 Δ Delta Mem. Temp (Tm) / Act Temp. > 30 Degree in Prod.
 Δ Delta Set / Act Temp. > 20 Degree in Production
 Δ Delta Set / Mem. Temp. (Tm) > 20 Degree
 V Enable Setpoint Ramp for Temp. Control
 P Heating Pumps Shut Off Valves
 V Position Fault Control Valve
 V Delta Mem. Temp (Tm) / Act Temp. > 30 Degree in Prod.
 Δ Delta Set / Act Temp. > 20 Degree in Production
 Δ Delta Set / Mem. Temp. (Tm) > 20 Degree
 V Enable Setpoint Ramp for Temp. Control
 P Heating Pumps Shut Off Valves

Ts Set Temperature
 Tr Contr. Temperature
 Tm Memorized Temperature
 Tact Actual Temperature

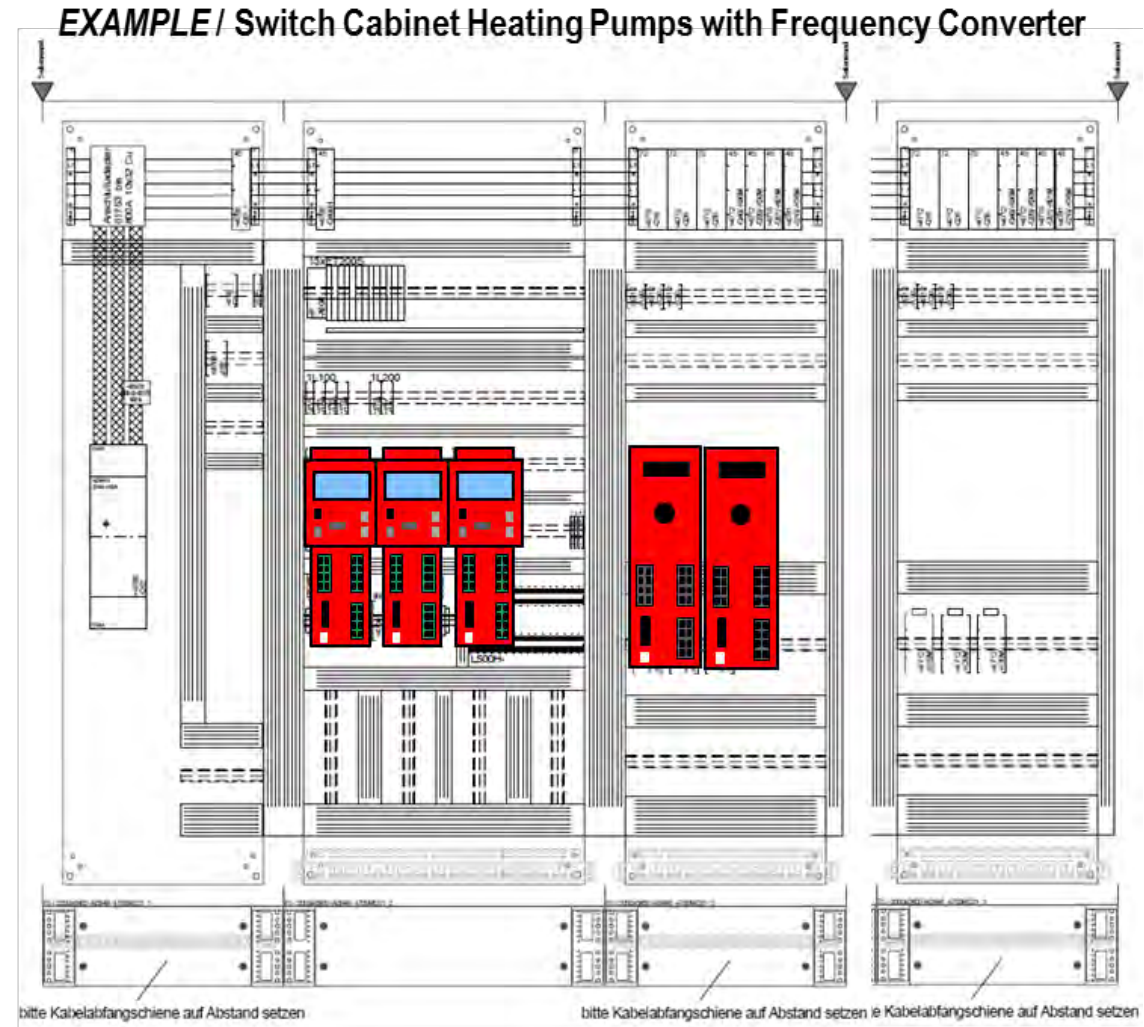
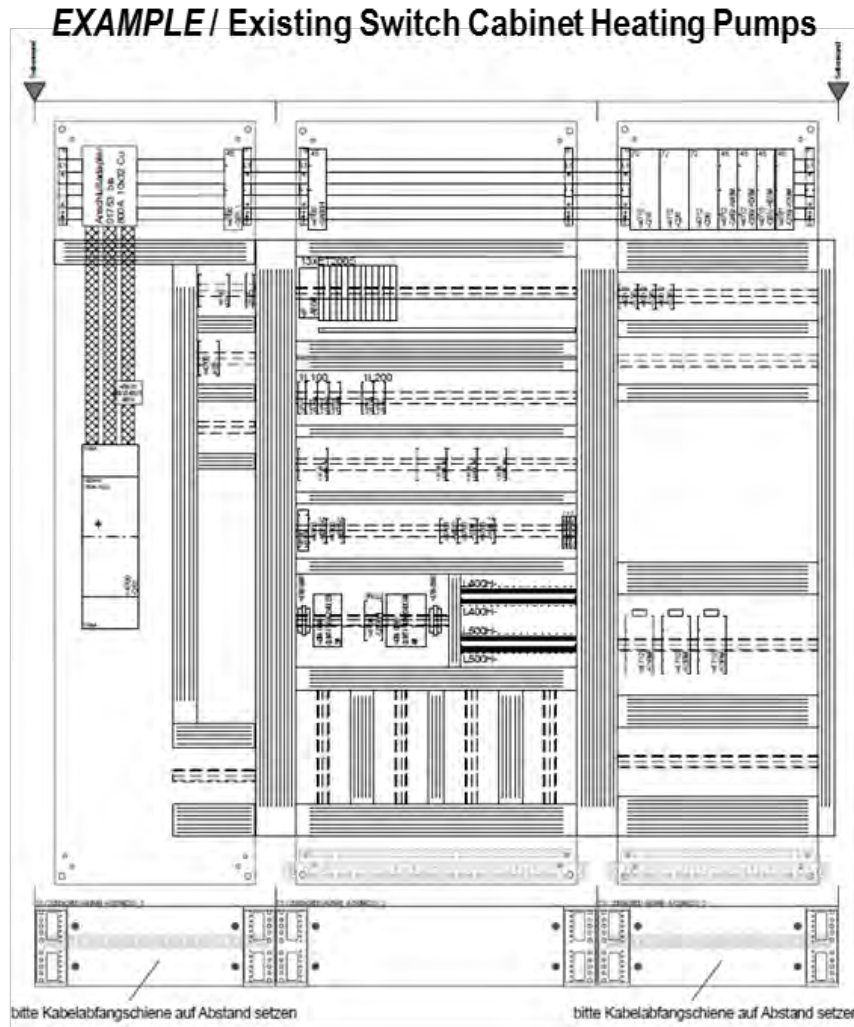
17:29:15 RackFault - Rack fault (OB86) 03.11.2011 11:44:41

Cabinet Overview

Frequency Controlled Heating Pumps



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Benefits

Frequency Controlled Heating Pumps

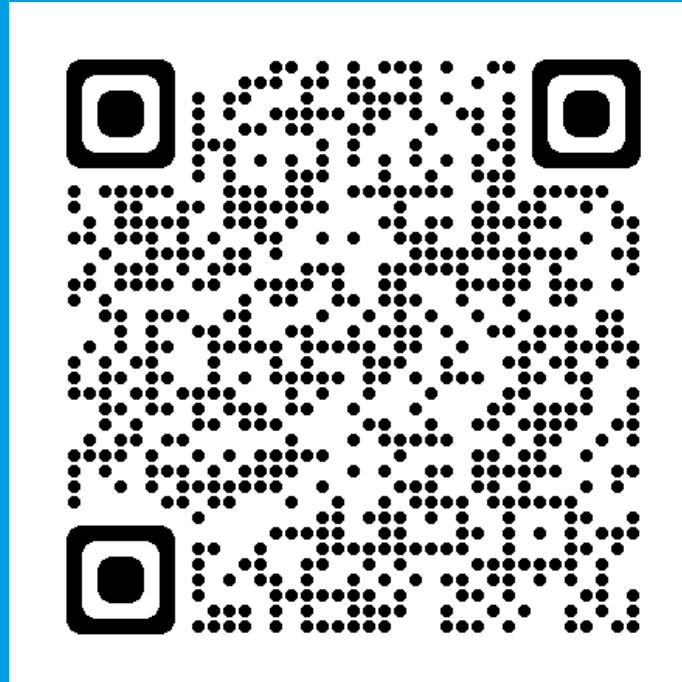


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- **Substantial savings of electrical energy (~ 30% to 50 % possible)**
- **Use of existing pumps and possibly of existing pump motors**
- **No long downtime for installation necessary (2-5 days)**



For more information on electrical modernizations, please scan the QR code

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