

# VSD ... The Use of Frequency Inverters with BITZER Screws

## Semi-hermetics + Hermetics - General Selection Criteria

### □ Frequency and Speed Ranges

- Standard range 25 to 60 Hz / 1450 to 3500 RPM
- Extended range (individual investigation required)
  - ➔ HS.53 / 64 20 to 75 Hz -- 1200 to 4500 RPM
  - ➔ CS.65/75/85/95\* 20 to 60 Hz -- 1200 to 3500 RPM
  - ➔ HS.74 / 85 20 to 67 Hz -- 1200 to 4000 RPM
  - ➔ VSK 31 20 to 87 Hz -- 1200 to 5200 RPM
  - ➔ VSK 41 20 to 70 Hz -- 1200 to 4200 RPM

\*Semi-hermetic Compact Screws: Capacity Control by integrated slider valve is preferred

VSD not in combination with integrated capacity control



# VSD ... The Use of Frequency Inverters with BITZER Screws

## Semi-hermetics + Hermetics – General Selection Criteria

- ❑ Motor Selection / Voltage & Frequency for 50 Hz power supply
  - Standard Motors (400V-3-50Hz) --  
suitable up to **60 Hz** (400V) if 25 % spare capacity at 50 Hz
  - Special Motors (400V-3-60 Hz or 230V-3-50 Hz)  
for trans-synchronous operation with full motor load

Consequences:      Operation not possible with direct supply  
(400V / 50Hz) & larger inverter required

Note!                  Dependant on inverter design and quality of sine wave,  
additional spare capacity for the motor may be needed



# VSD ... The Use of Frequency Inverters with HS. & OS. Screws

## Semi-hermetics + Hermetics –

## General Selection Criteria

- ❑ Motor protection (Series HS.53/64/74/85)  
INT389R (old) and SE-E1 (new standard for HS.) are not recommended

Alternative systems:

- ❑ INT69VSY-II
  - combined with additional anti short cycling timer
  - possibly additional external overloads (dependent on inverter overload protection system)
- ❑ **NEW:**  
Alternative motor protection devices  
SE-C1 (for CS. Screws) and SE-C2 (for HS. Screws)  
are suitable for VSD by means of Frequency Inverter



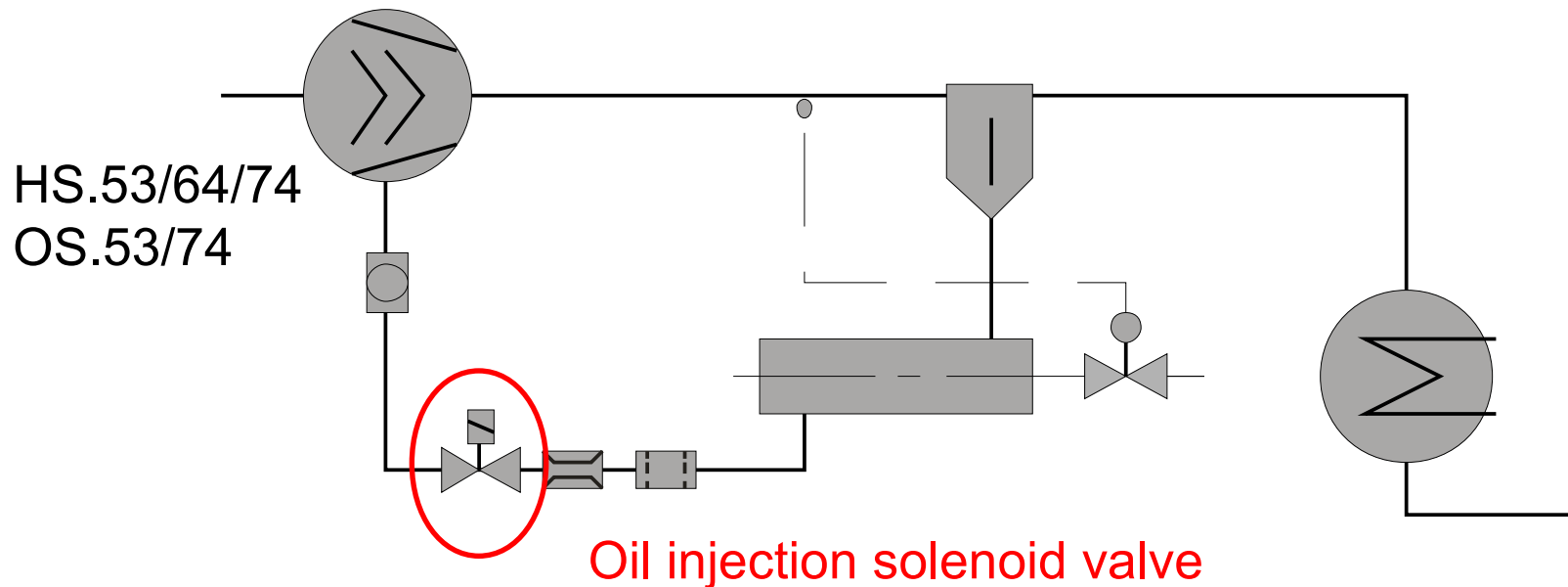
SH-100-3 (46)



# VSD ... The Use of Frequency Inverters with HS. & OS. Screws

## Semi-hermetics + Hermetics – General Selection Criteria

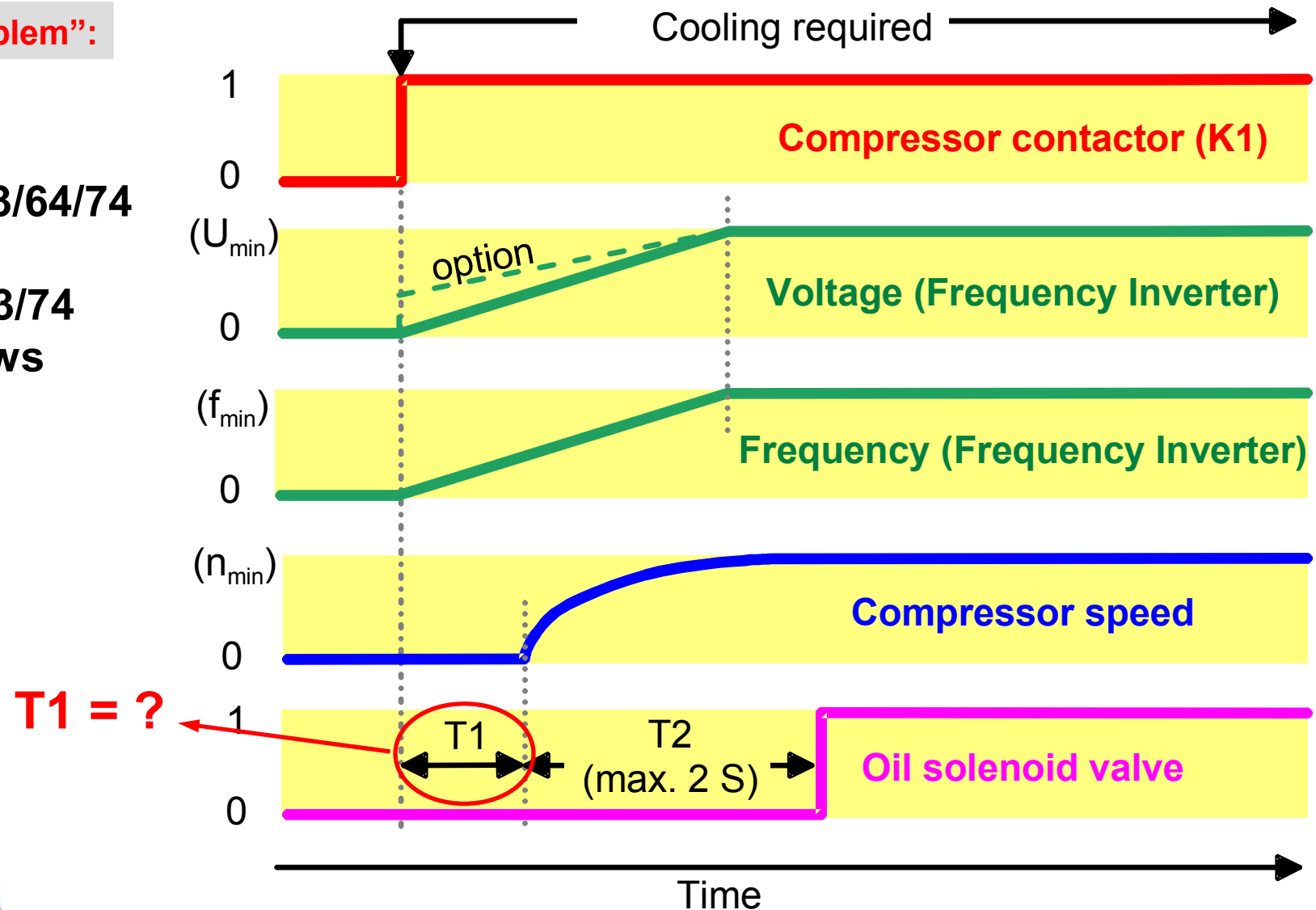
- ❑ Control of oil injection solenoid valve (Series HS.53/64/74, OS.53/74)
  - ensure energizing of the solenoid two seconds after start
    - ➔ too early oil supply leads to blocked compressor
    - ➔ too long delay provokes mechanical damage (& shaft seal leakage)



# The Use of Frequency Inverters – Screws Start Procedure with Frequency Inverter

**“Problem”:**

HS.53/64/74  
&  
OS.53/74  
Screws

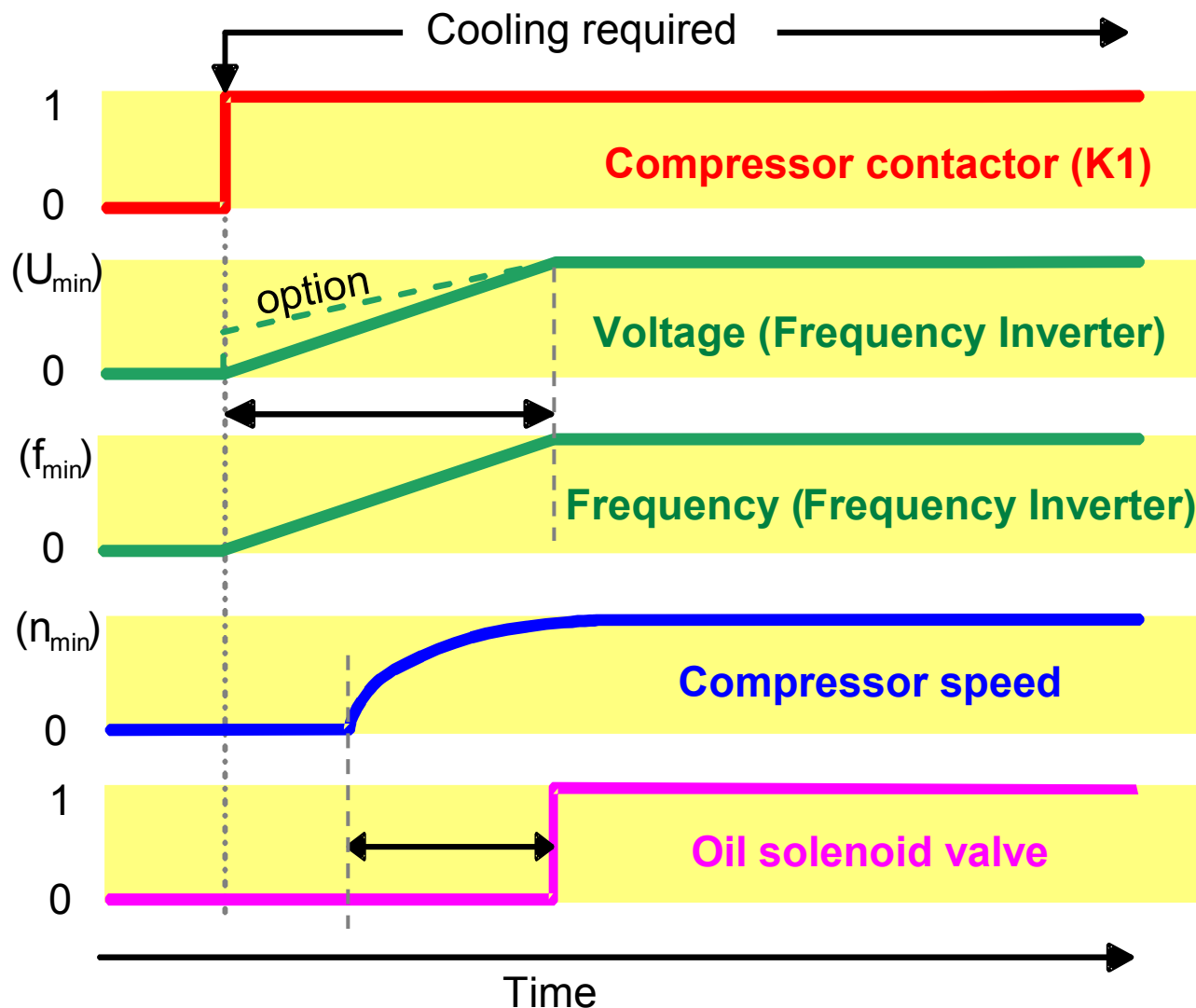


## Start Procedure with Frequency Inverter

### Recommendation:

Starting ramp  
with max. 3 S

Natural starting  
delay ensures  
that the  
oil solenoid  
valve will be  
opened within  
2 sec time frame  
after compressor  
speeding-up



# The Use of Frequency Inverters with BITZER OS. Compressors

## Open Drive Compressors – General Design Criteria

- ❑ Speed ranges OS.53
  - Standard range 1450 to 4500 RPM
  - Extended range 1200 to 4500 RPM
    - ➔ individual investigation required !!!
  
- ❑ Speed ranges OS.74 (OS.85: consultation with BITZER)
  - Standard range 1450 to 4000 RPM
  - Extended range 1200 to 4000 RPM
    - ➔ individual investigation required !!!

