



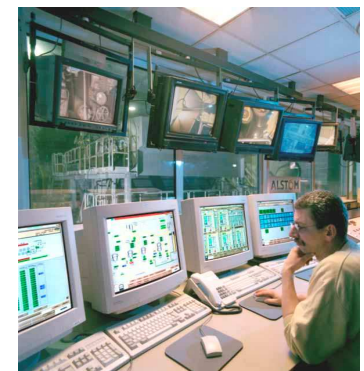
# Multi-Megawatt Motor Drive Technology

Steven Moran 30 March 2009

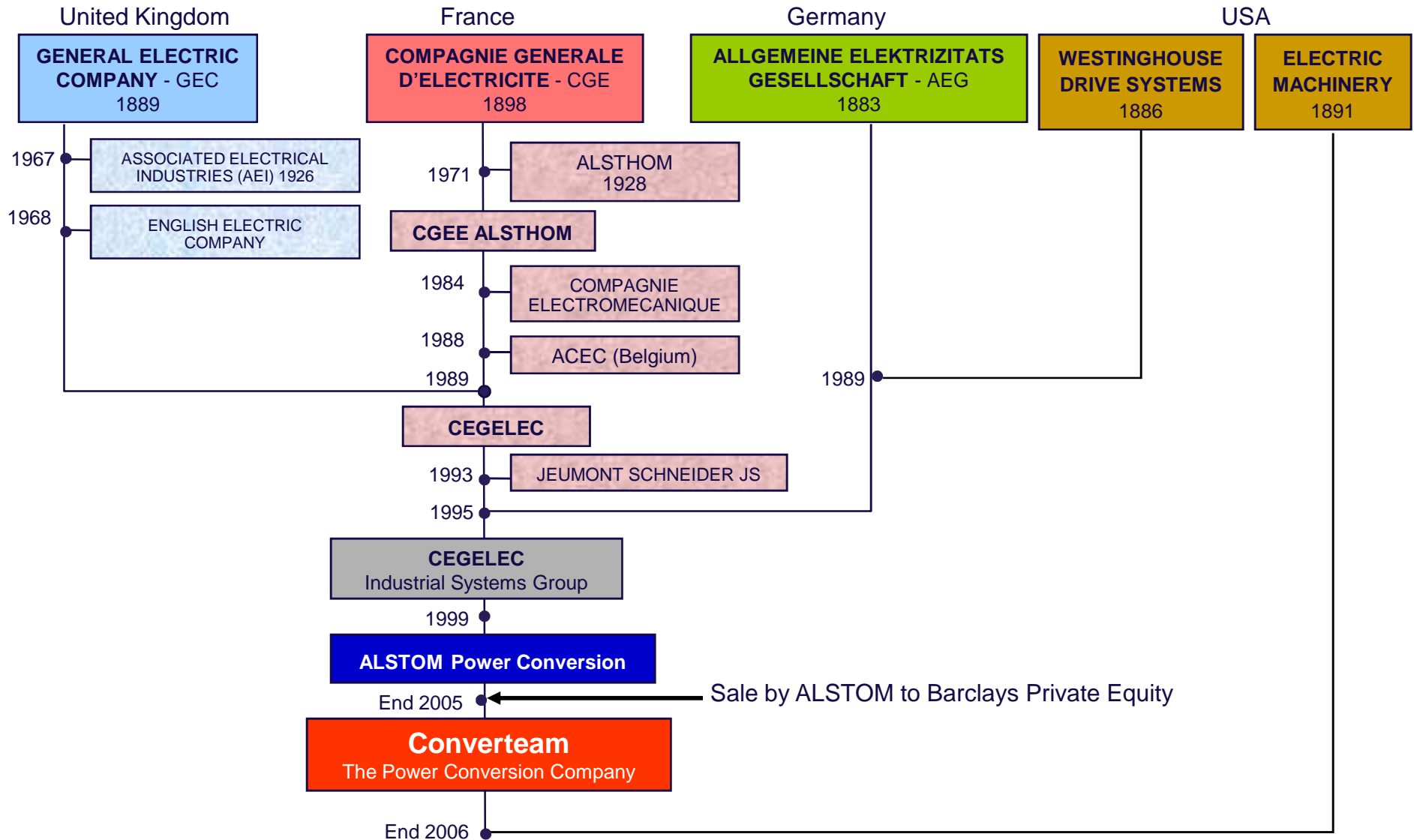
**CONVERTTEAM**  
THE POWER CONVERSION COMPANY

# CONVERTEAM AT A GLANCE

- **Converteam – an engineering company with more than 100 years experience providing customized solutions**
- **These solutions are made of systems built around 3 core components:**
  - Rotating Machines
  - Variable Speed Drives
  - Process automation & control
- **We address 4 major markets:**
  - Marine
  - Oil & Gas
  - Energy
  - Industry
- **Our scope covers consulting, design, manufacturing, system integration, installation, commissioning and a broad range of services**

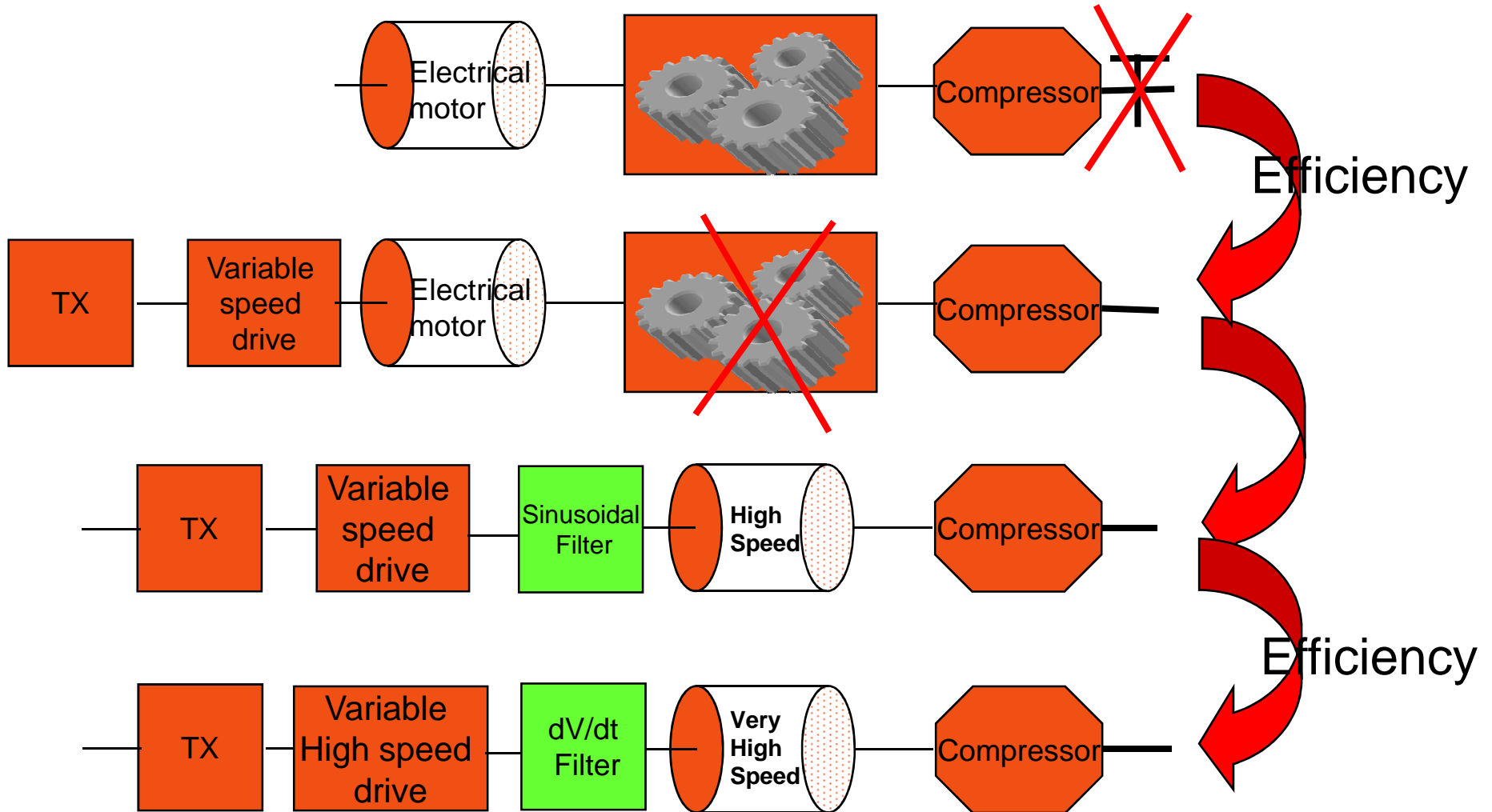


# MORE THAN 100 YEARS OF EXPERIENCE





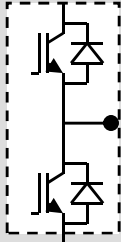
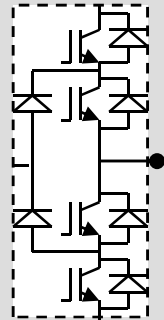

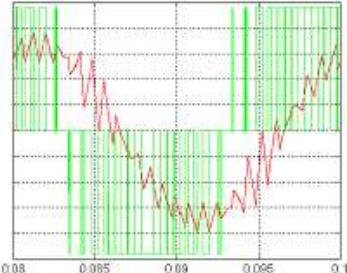
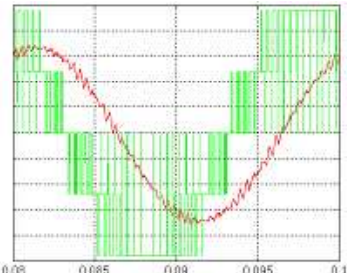
# Gas compression: Electrical Solutions



## Converteam MV 7000 Systems

<b>VARIABLE SPEED DRIVE SYSTEM</b>			
<b>TYPE</b>	<b>POWER</b>	<b>MOTOR TYPE</b>	<b>TECHNOLOGY</b>
<b>MV7000</b>	<b>2 to 32 MW</b>	High speed motor Induction motor Synchronous motor	<b>MV- IGBT press pack</b>
<b>SD7000</b>	<b>10 to 100 MW</b>	Synchronous motor High speed synchronous motor	<b>LCI - Thyristors</b>

# MV Drives Topology Comparison

Topology	2-Level inverter	3-level NPC	3-Level NPP
Performances			
Output voltage & current			Switching frequency x 2  50% reduction of current ripple
Applicable to	LV drives	MV drives	MV drives
Drive series	MV3000 – MD2000 – LV7000	MV 7000	MV drives next generation
Power	Up to 3 MW	up to 32 MW	up to 46 MW
Voltage	690 V	3.3 - 6.6 kV	3.3 - 6.6 kV
Current in motor	3140 A rms	2800 A rms	4025 A rms

## MV7000 VFD Range

MV7000 Range	Voltage	Power (MW)
MV7306	3300	6
MV7308	3300	8
MV7312	3300	12
MV7316	3300	16
MV7403FP (air-cooled)	4160	3
MV7406FP (air-cooled)	4160	6
MV7612	6600	12
MV7616	6600	16
MV7624	6600	24
MV7632	6600	32

### Main features of the drive system:

Uses a PWM inverter for the motor and one of the following front ends:

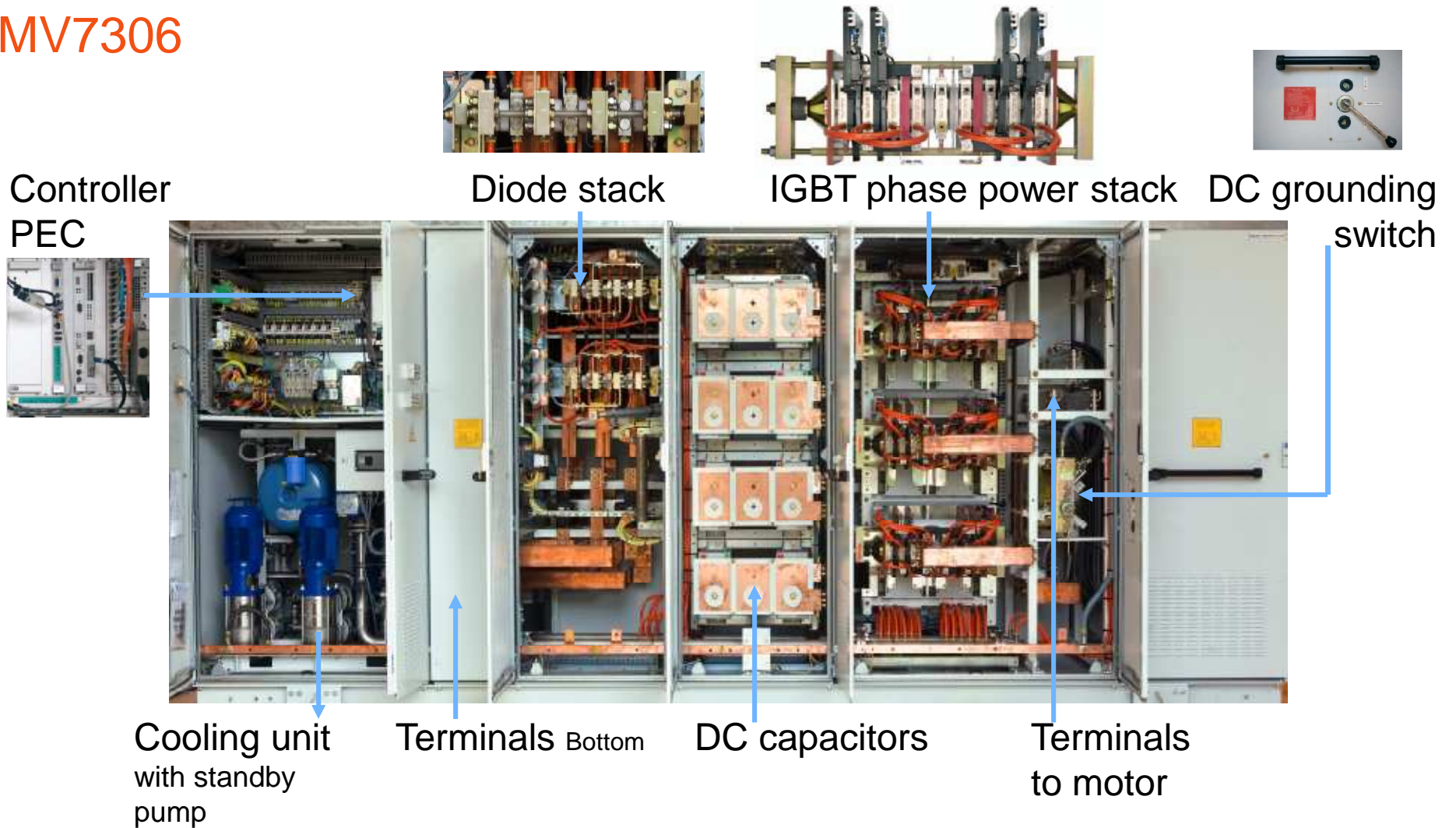
- 12 pulses diode front end (option- Active front end)
- 24 pulses diode front end (option- Active front end)

**A family of drives up to 32 MW**

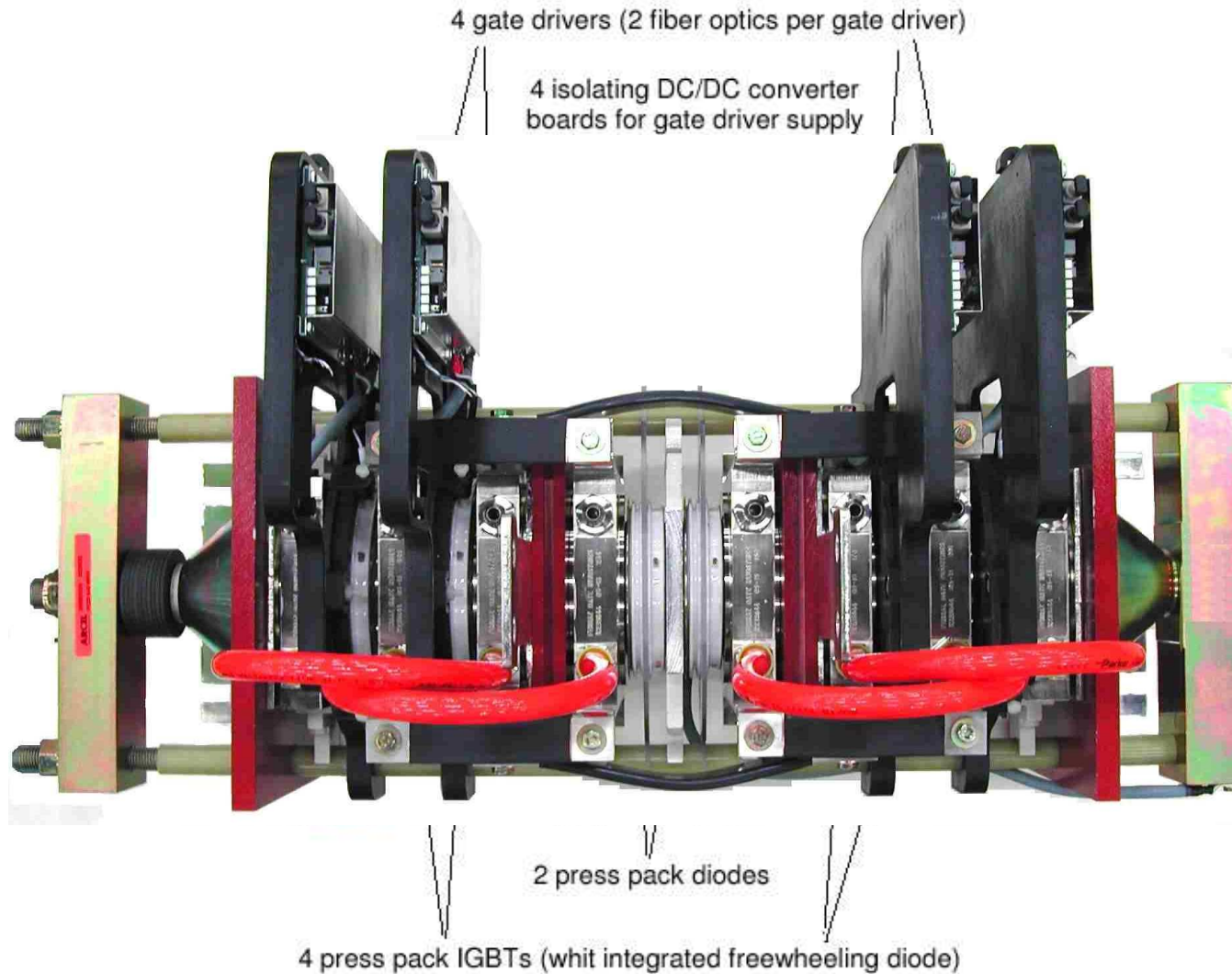


# MV7000 Today's Technology

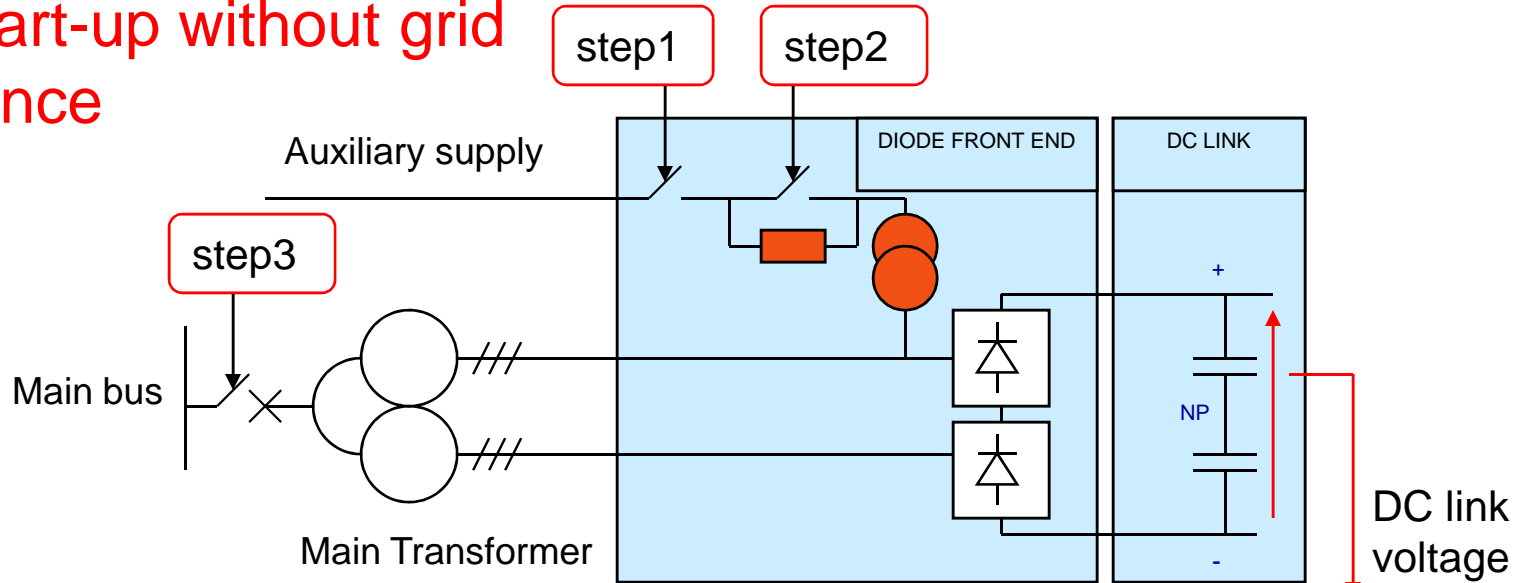
## MV7306



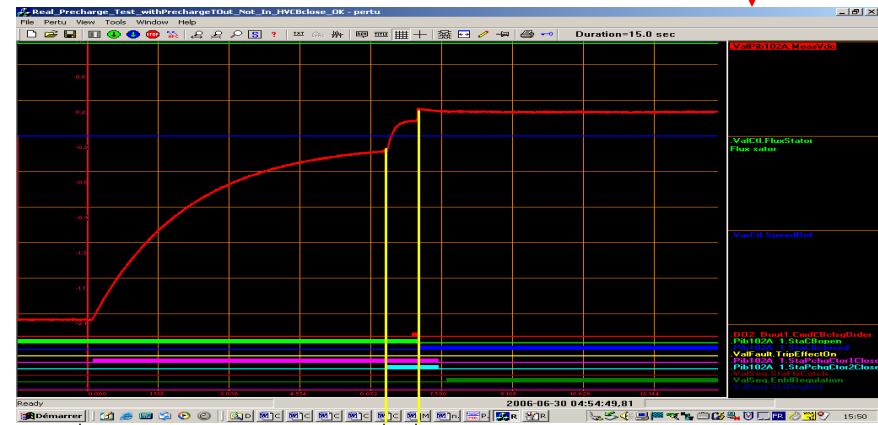
## Inverter - phase leg: the heart of the converter



- Soft start-up without grid disturbance



- MV7000 provides low inrush current when energising the drive
- Pre-magnetising of the input transformer is achieved by means of auxiliary transformer.
- Closing of main circuit breaker is completed without incoming bus disturbances





# Active Front End

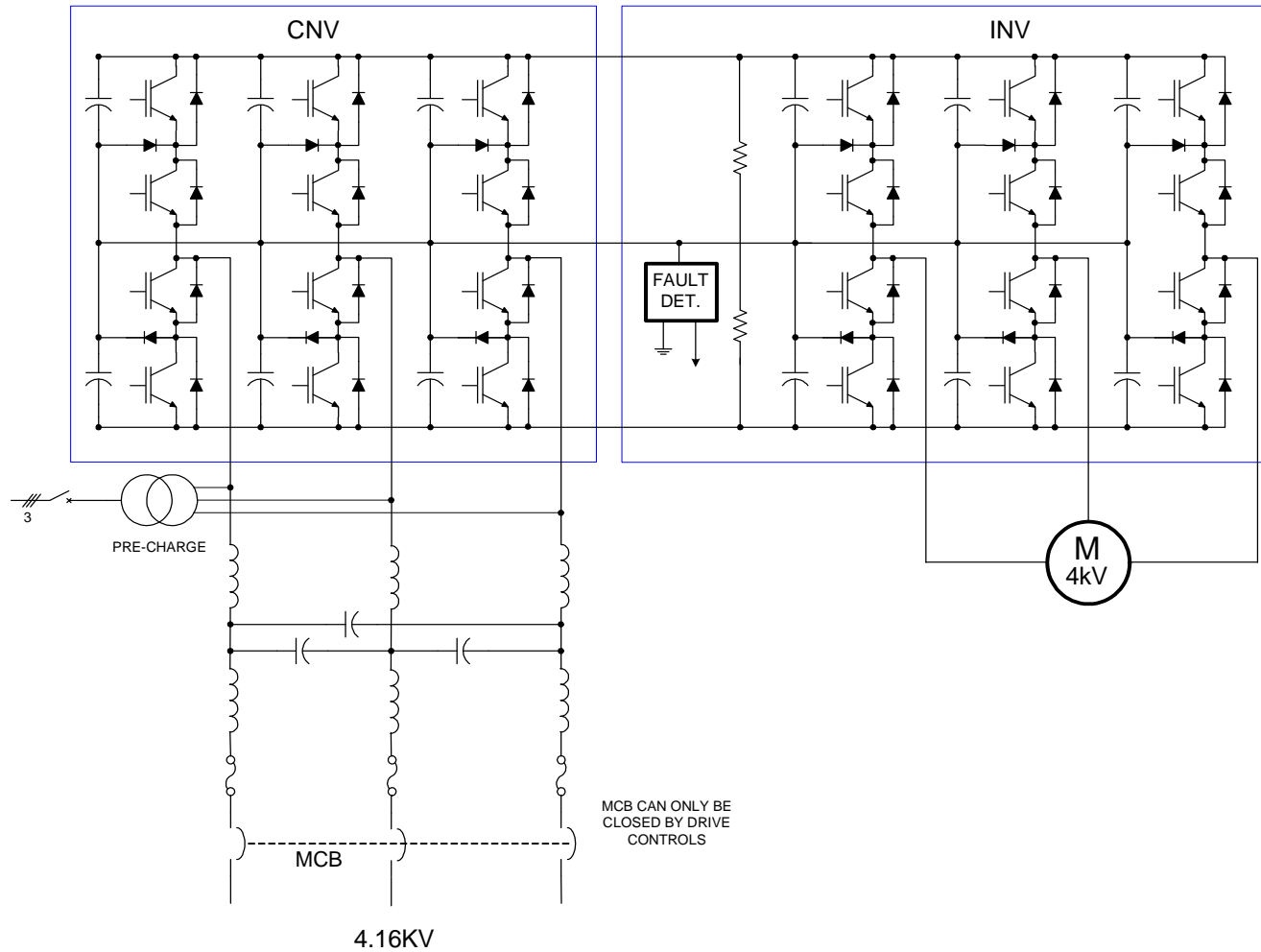


Figure 5. Converteam HTLC Starter

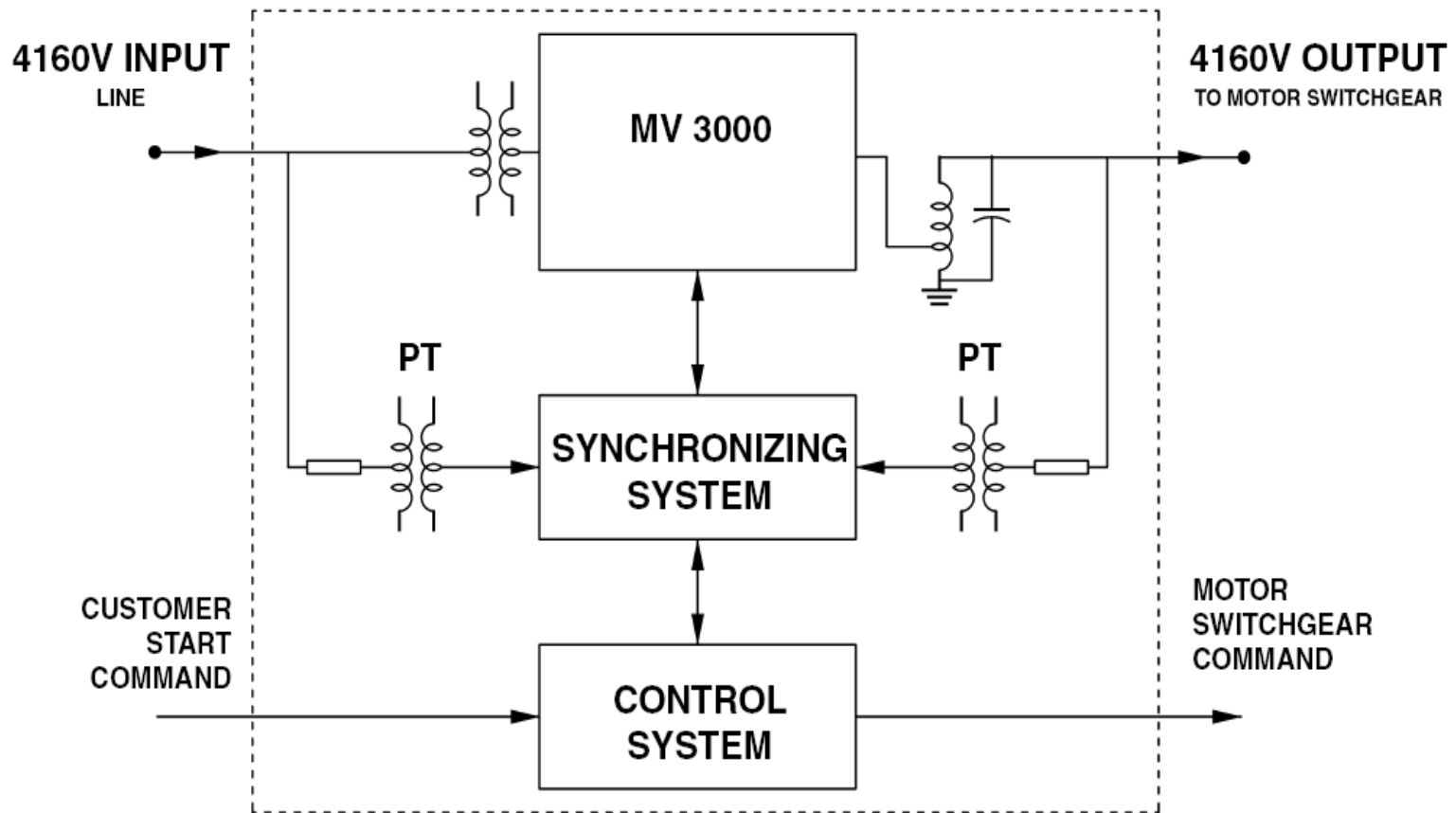
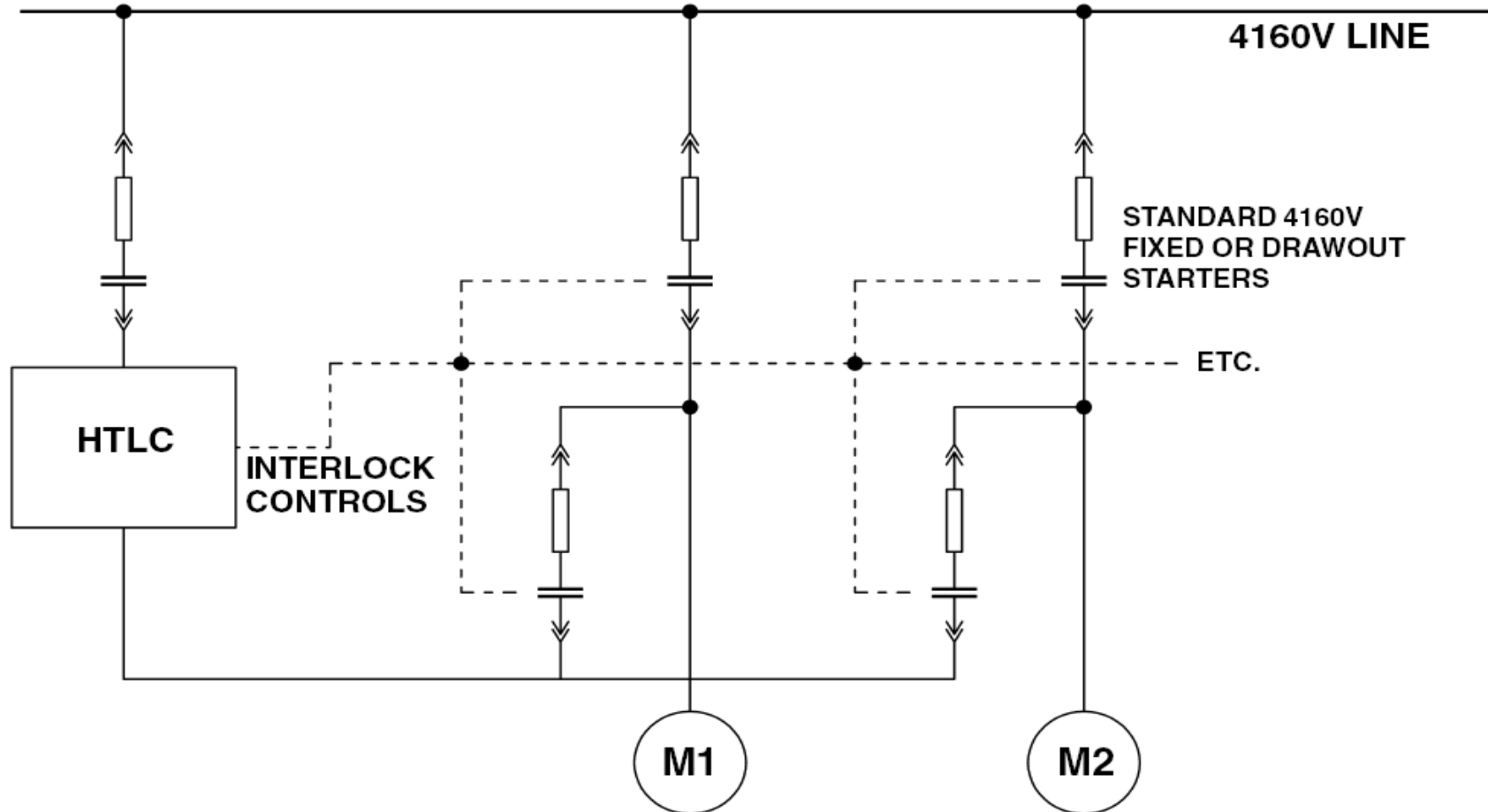
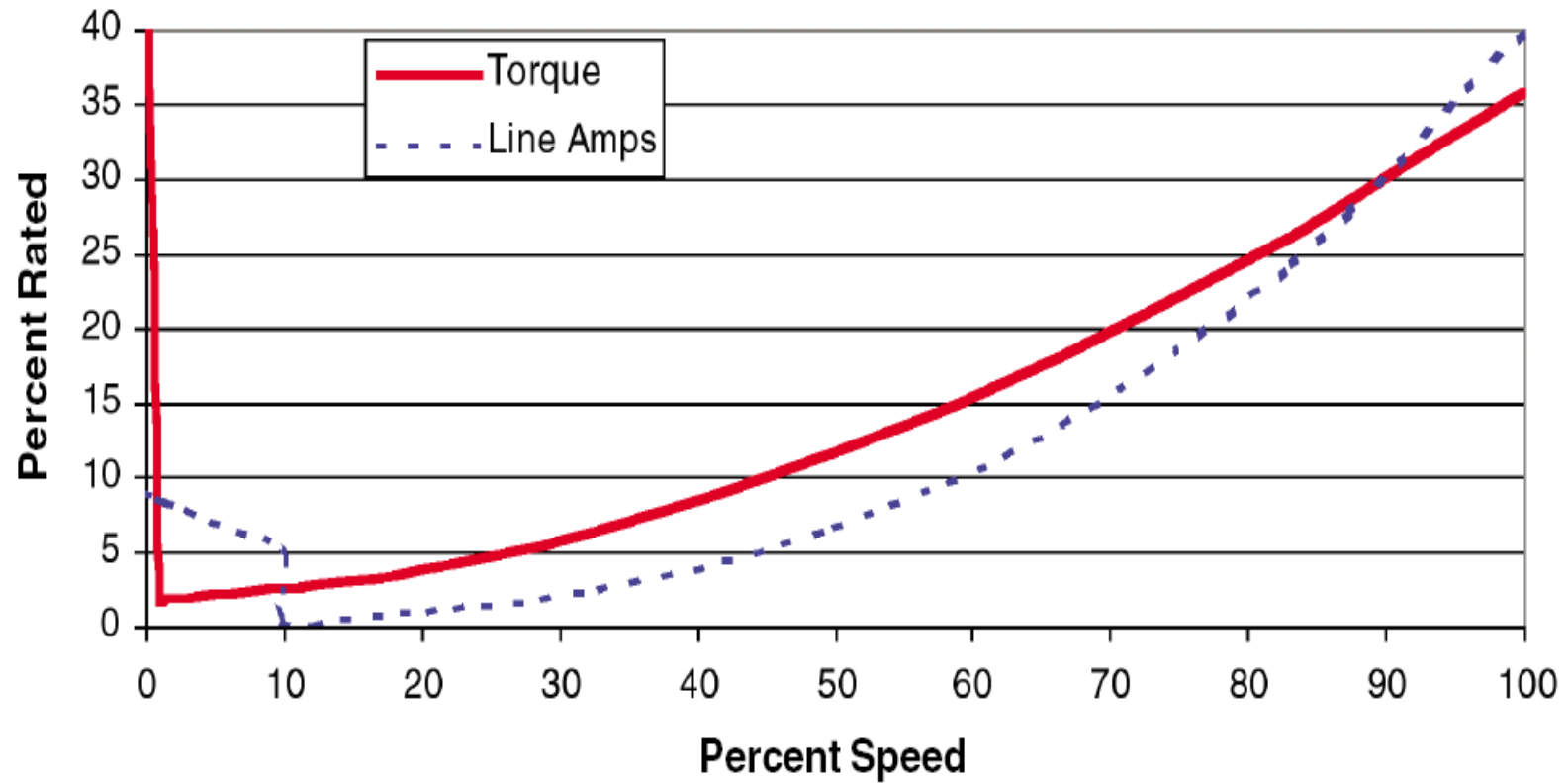


Figure 6. Typical Switchgear for HTLC Starter

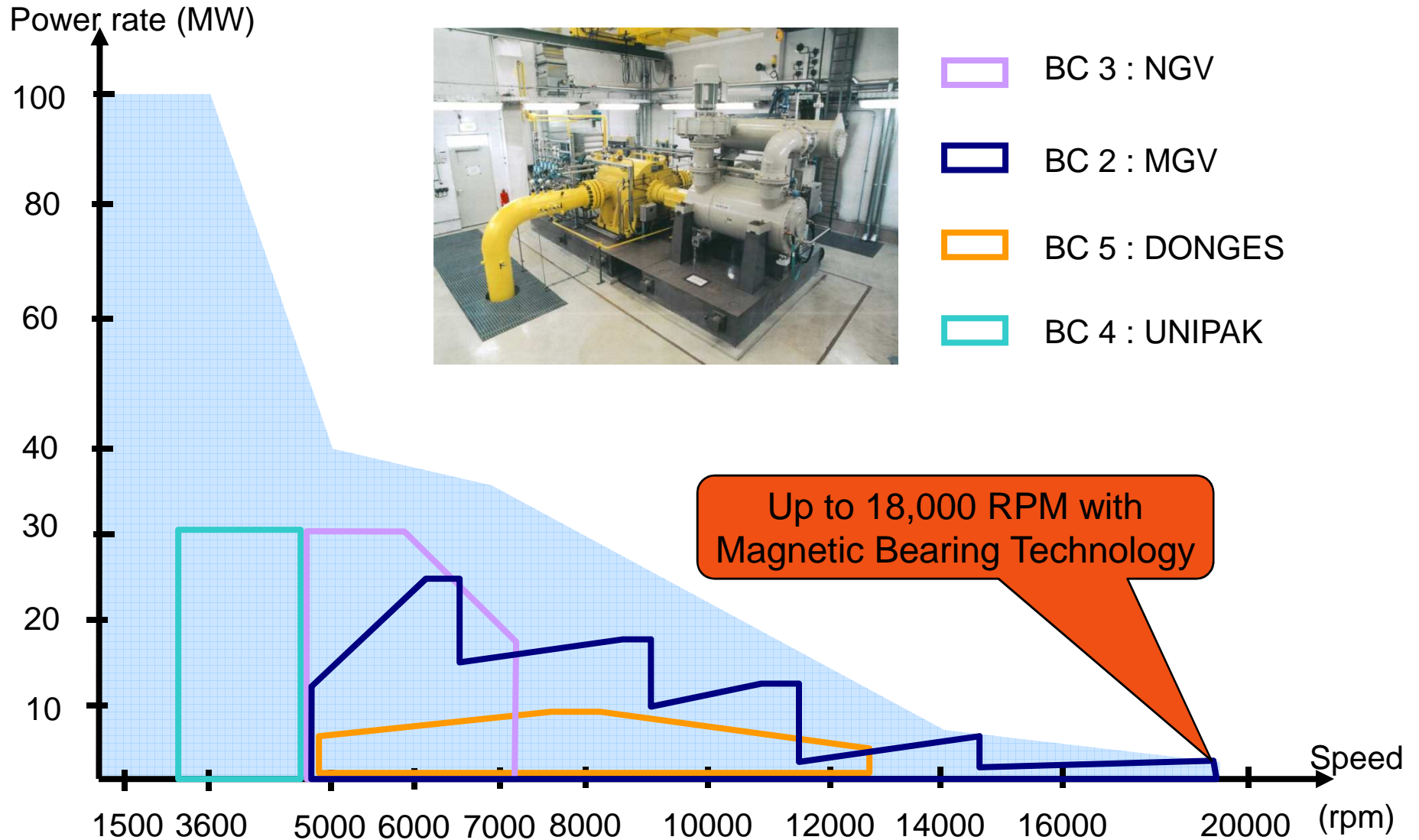


**Figure 4. HTLC Compressor Starting**





# Induction motor technology



Thank you for your attention

[www.convertteam.com](http://www.convertteam.com)

**CONVERTTEAM**  
THE POWER CONVERSION COMPANY