



NIDEC INDUSTRIAL SOLUTIONS

SILCOVERT-FH

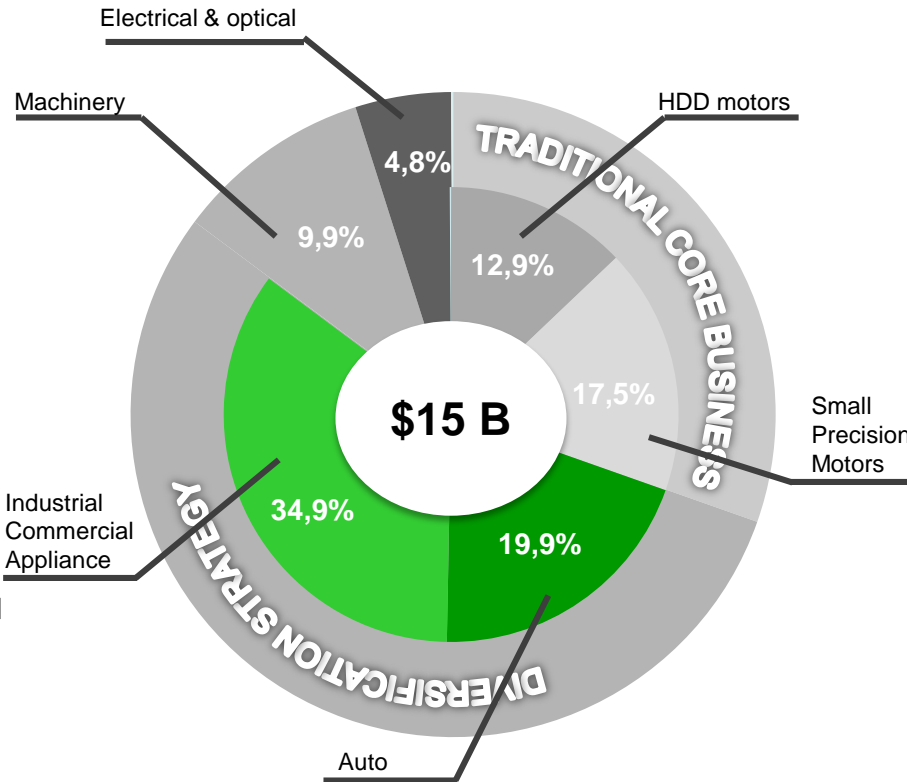
Gas/Electric Partnership 2020

Paolo Osgnach - February 5th-6th, 2020



NIDEC CORPORATION OVERVIEW

FY17 SALES BY PRODUCT GROUP



- More than 250 Nidec companies dot the globe
- Rapidly becoming the number one brand for electric motors and related solutions globally
- More than 135 factories in over 33 nations

Workforce: 107,000
Market capitalization: \$28B USD

February 2017: Nidec acquires Leroy Somer (France) and Control Techniques (UK).
 Today the industrial sector represents the 20% of entire turnover.

Financially solid and ready for the next 100 years of growth





PRODUCTS & SYSTEMS 70%



SERVICE 30%

OUR CORE PRODUCTS



Encoders



MV & LV Drives



Electric Motors
& Generators



Power Supply
& Power Quality



Industrial Automation
& Control

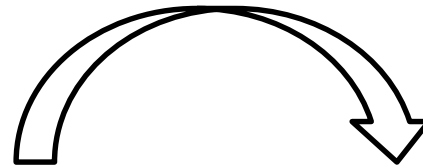
Brand New Facility – Move in March 2020



- ✓ Total size – 67,000 sq ft
- ✓ High bay 32' clearance
- ✓ Mfg with 22' clearance
- ✓ 3 docks plus one drive-in
- ✓ Qty (2) 20 ton bridge cranes
- ✓ controls by Nidec

MOVE TOWARDS TRANSFORMER-LESS TECHNOLOGY

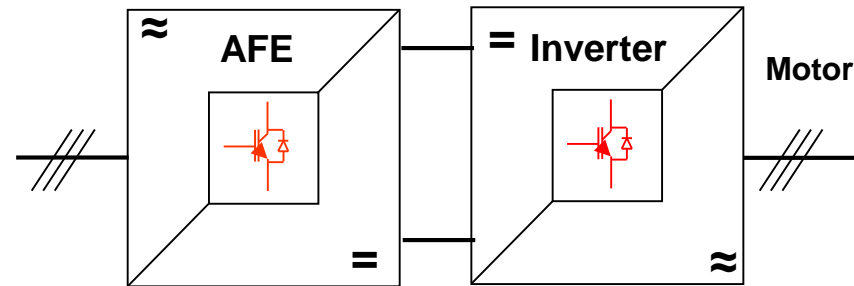
4Q Transformerless Converters



4Q Transformer-less VFD Configuration

Improve waveform quality

Increase efficiency



Unity power factor

Grid ← P → Load

Almost sinusoidal waveforms,

Bidirectional power flow: regenerative braking possible

Simplify System integration

Environmentally sustainable

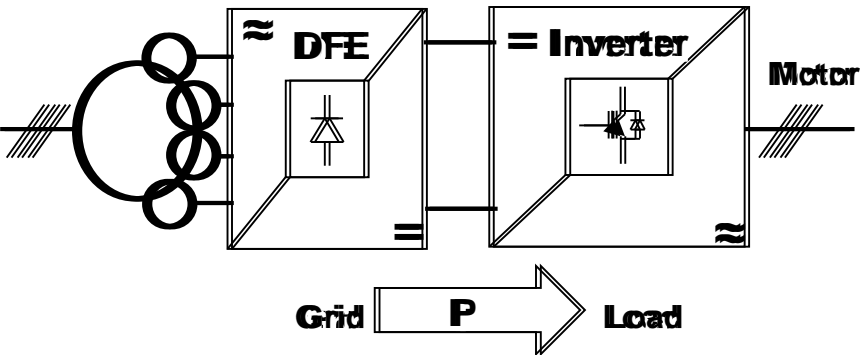
Reduce size & weight

Cost competitive

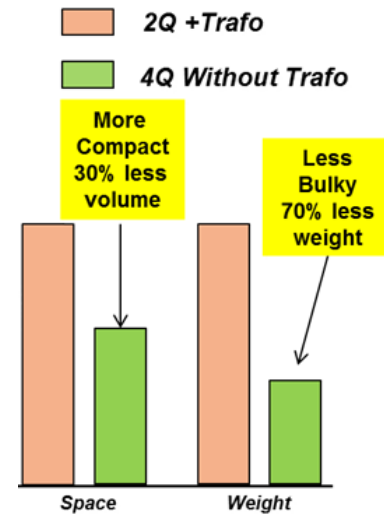
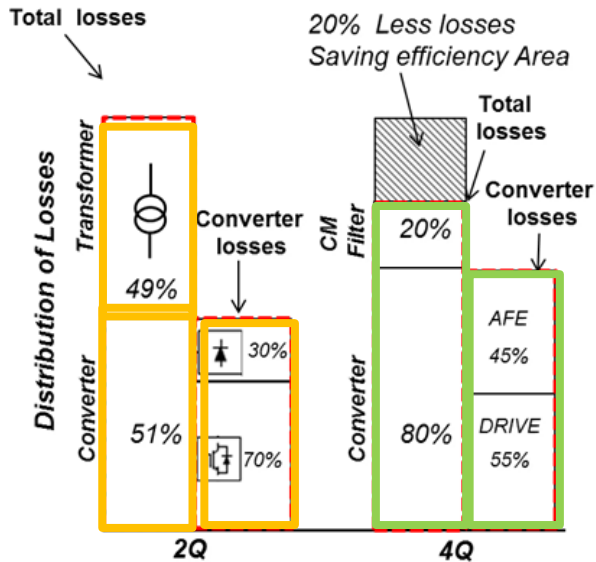
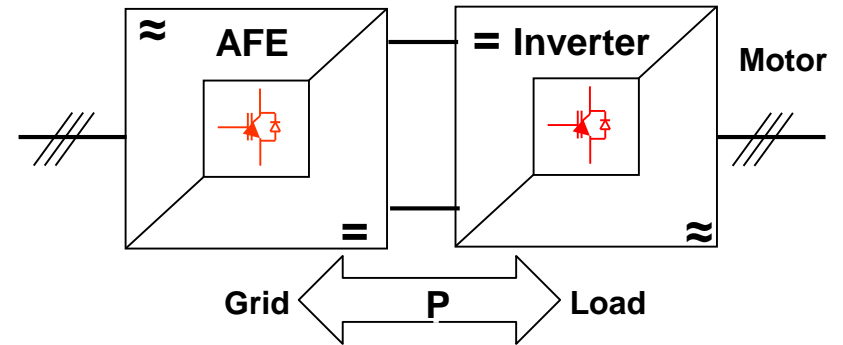


BENEFITS OF 4Q TRANSFORMER-LESS TECHNOLOGY

Traditional 2Q VFD Configuration

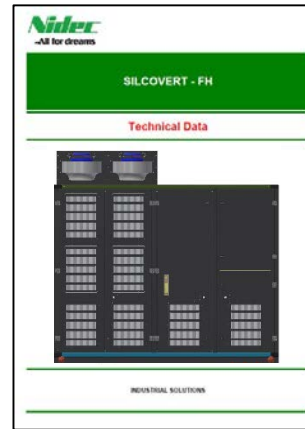


4Q Transformer-less VFD Configuration



SILCOVERT-FH PRODUCT PORTFOLIO

SVFH-5L 3.3 kV	[400 800 1255] kVA
SVFH-5L 4.16 kV	[500 1000 1500] kVA
SVFH-7L 6.0 kV	[725 1455 2285] kVA
SVFH-7L 6.6 kV	[800 1600 2585] kVA



Cabinet size 5L
W: 2900 mm; D: 1200 mm; H: 2300 mm (no fans)

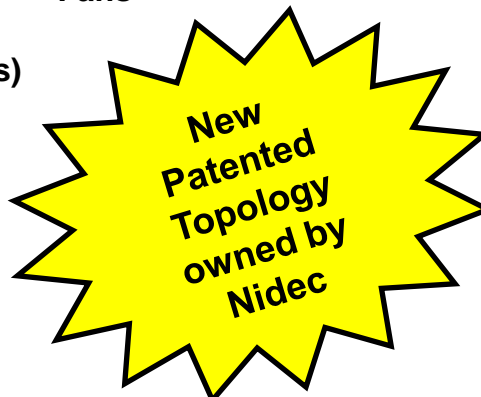
5L	Rated output voltage	Rated output current	Rated output apparent power	Rated output motor shaft power ⁽¹⁾	
	[kV]	[A]	[kVA]	[kW]	[HP]
3.3	70	70	400	349	468
	140	140	800	699	937
	220	220	1257	1098	1472
4.16	70	70	504	440	590
	140	140	1009	881	1181
	220	220	1585	1384	1856

Market segment
 Energy, Oil & Gas, Marine,
 Water and Test facilities

Main applications
 Pumps, compressors,
 Fans

Cabinet size 7L
W: tbd mm; D: 1200 mm; H: 2300 mm (no fans)

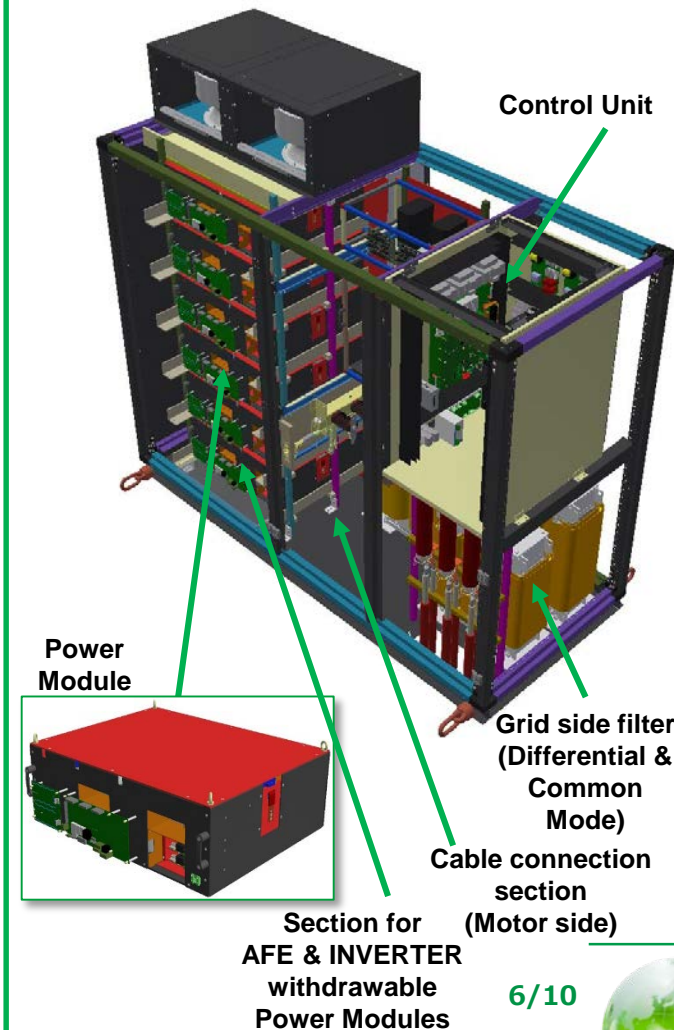
7L	Rated output voltage	Rated output current	Rated output apparent power	Rated output motor shaft power ⁽¹⁾	
	[kV]	[A]	[kVA]	[kW]	[HP]
6.0	70	70	727	635	852
	140	140	1455	1270	1703
	220	220	2286	1996	2677
6.6	70	70	800	699	937
	140	140	1600	1397	1874
	220	220	2515	2196	2944



⁽¹⁾ $\eta_{mot} = 0.97 \cos\phi_{mot} = 0.9$

SVFH 5L 4Q transformer less

30% More Compact
60% less bulky



SILCOVERT-FH KEY FEATURES AND FUNCTIONS

Main key benefits & features of new SILCOVERT FH transformer less 4Q converter

Grid side:

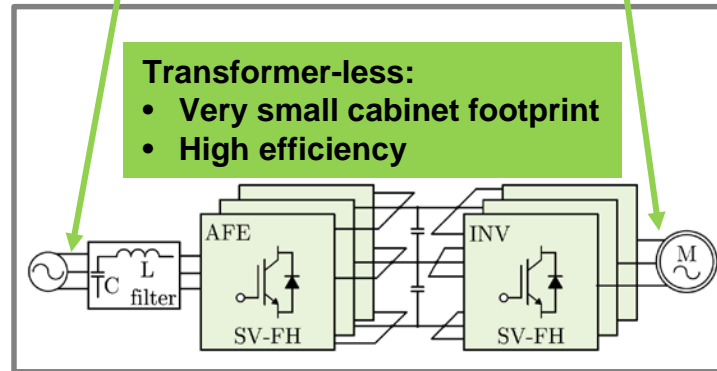
- Almost sinusoidal waveforms, $THD(I) \leq 1.5\%$
- Unity power factor

Low common mode voltage thanks to advanced PWM and filter

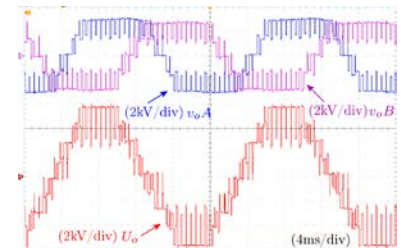
3 cables in, 3 cables out

Transformer-less:

- Very small cabinet footprint
- High efficiency



Low harmonic content on Motor side



Bidirectional power flow:
regenerative braking capability



Same standard
Power Modules
for AFE e Inverter

Main control features

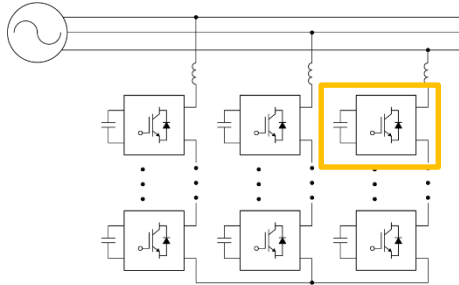
- Scalar (V/Hz) or vector (FOC) control of induction motor
- Sensorless control
- Flying restart and ride through (kinetic energy recovery)
- Smart HMI on tablet or smartphone through Nidec App
- Easy commissioning
- Autotuning function for easy start-up



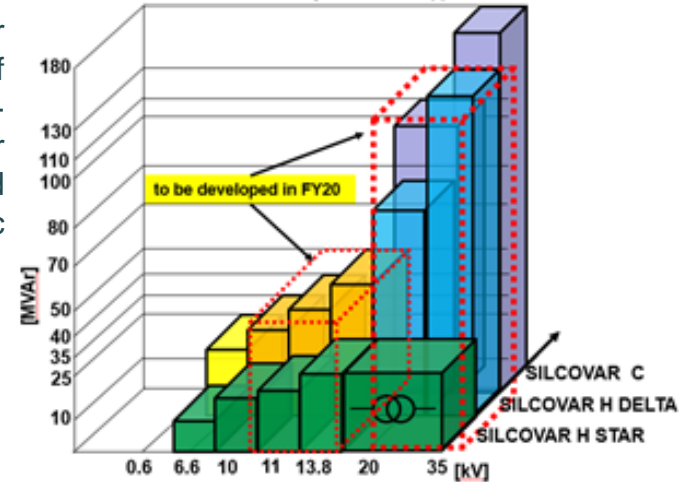
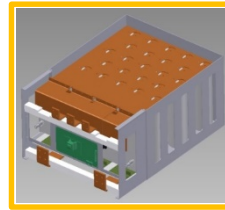
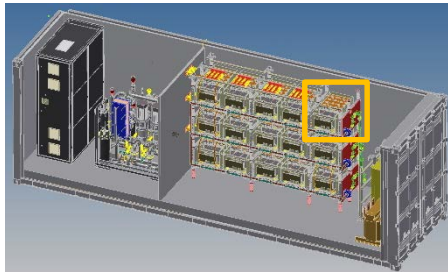
- Wireless local connection
- Cyber security
- Drive monitoring and diagnostics (basic operator/management)
- Fine tuning and commissioning (advanced operator)
- Internet remote connection (Cloud or local/Nidec server) for documents download

TRANSFORMER-LESS TECHNOLOGY

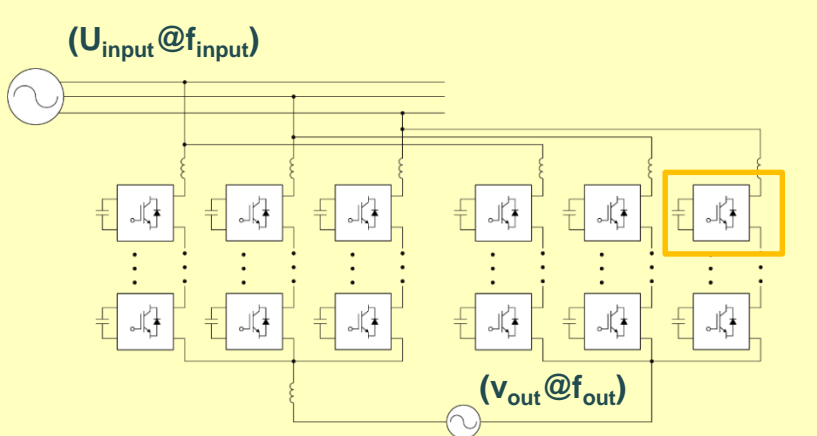
SILCOVAR-H: transformer-less statcom for Power Quality improvement



The **SILCOVAR-H** is a fast reactive power compensation system that takes advantage of Nidec's proven experience in Cascaded H-Bridge Multilevel Converters for high power Medium Voltage applications. It is obtained thanks to the series connection of many basic Power Electronics Building Blocks (**H-Bridge**)



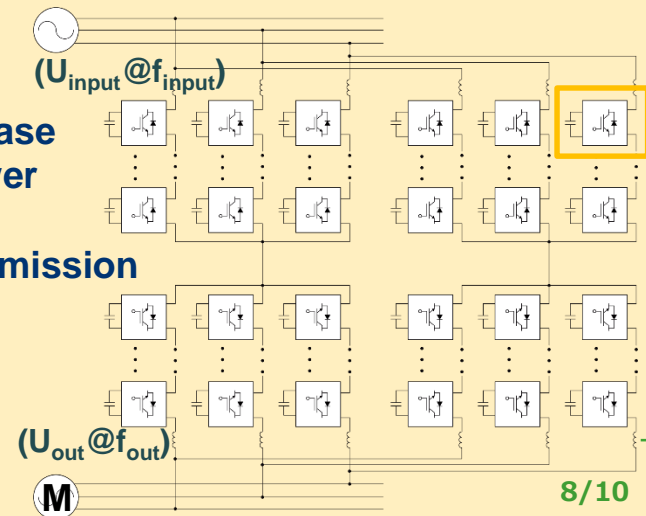
Transformer-less direct AC/AC converters, single-phase and three-phase



Static Frequency single-phase converter for railway applications

3-phase to 3-phase

- 4Q high power MV drives
- HVDC Transmission





For more information

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