Powerdrive FX

Ultra compact regenerative drive solution

22 kW - 90 kW (30 hp - 125 hp)
400 V – 480 V

LEROY-SOMER™

Nidec
All for dreams

Powerdrive FX
Drives with dynamic braking

Based on innovative “C-Light 4 Quadrant” technology, the variable speed drive Powerdrive FX offers an ultra compact regenerative solution. Thanks to a new generation of controls, Powerdrive FX provides a high performance sensorless Permanent Magnet motor mode.

Innovative technology

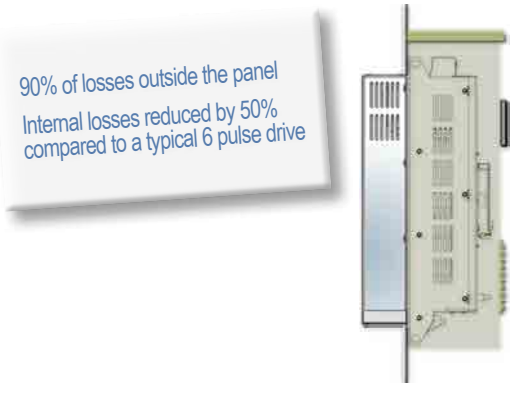
- Dynamic braking: naturally regenerative rectifier (patented)
- No braking resistor required
- Higher efficiency than conventional solutions
- Powerdrive FX Total Harmonic Distortion (THDI) better than IEC 61000-3-12 standard and independent of the load
- Size reduction of components on the power supply side (transformer, disconnect switch, cables...) due to improved waveform quality
- No over-voltage on motor terminals due to stabilized DC bus
- Less losses: low value line reactor, film technology capacitors...

Integrated safety functions

- Safe Torque Off inputs: disable drive in 2 separate channel logic (SIL3 - PLe)
- Security mode: protection disabled to force the drive to run (smoke extraction, fire mode). Operation guaranteed at 70 °C (158 °F) for 1 hou
- Diagnostics
  - time-stamping of last 10 trips
  - records of events preceding a trip

Suitable for outdoor installation

- Can be fitted in reduced size IP 54 (NEMA 12) enclosures
  - designed for through panel mounting
  - IP 54 line reactor integrated to heat sink
  - low loss capacitors
  - integrated PLC functions
- Optional enclosure for harsh environments



Outstanding PM Sensorless control

Powerdrive FX – high performance motor control.
Control modes:

- Asynchronous motors: all modes (fixed or dynamic V/F (U/F), vector control...)
- Permanent Magnet synchronous motors: Sensorless control
  - up to 80% starting torque
  - full torque from 1/20 of nominal speed
- Speed / position feedback option for high dynamic applications or full torque at standstill

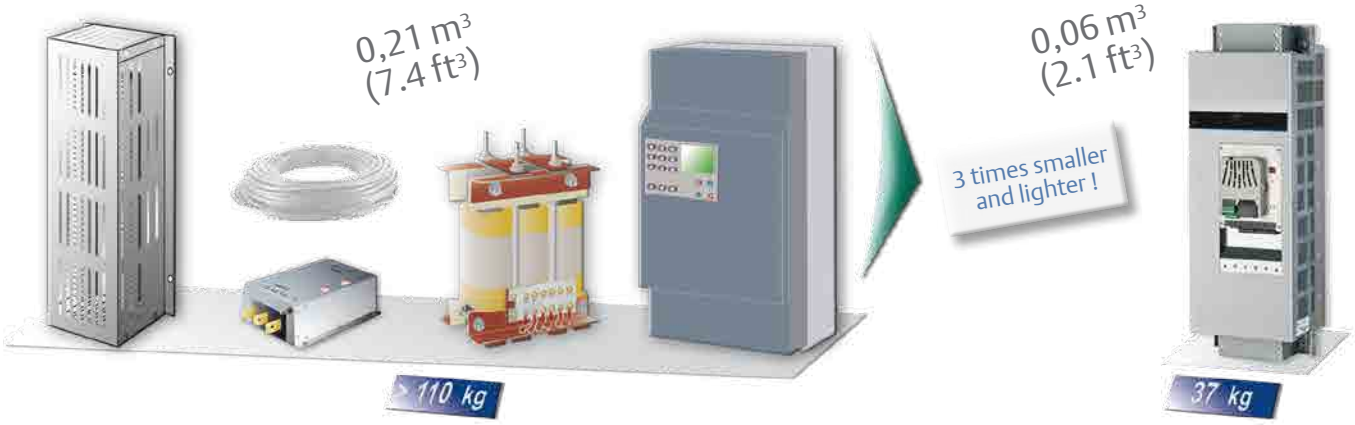
Unequaled power density

Conventional solution

6 pulse drive + line reactor + RFI filter + braking resistor + overload relay + cables

Powerdrive FX 100T

Integrated RFI filter



Comparison for 90 kW (125 hp) 4 quadrant application, up to 10 m (32 ft) of drive to motor cables, complies with C2 EMC standards according to IEC 61800-3, and THD must be < 35% - Total weight without cables

Powerdrive FX Overview

Order code

AC drive

POWERDRIVE FX 33 T

Regenerative variable speed drive
(4 quadrant)

Rating in kVA

Supply voltage
400 V -10 % to 480 V +6 % 3-phase, 50 or 60 Hz ± 2 %

Conformity

- IP 20 protection complies with EN 60529 standards
- Ambient temperature: from -10 °C to +40 °C (-19 °F to +104 °F) up to +50 °C (+122 °F) with derating
- Storage temperature: from -30 °C to +70 °C (-22 °F to +158 °F)
- Relative humidity: IEC 60068-2-56 < 90 % at 40 °C (104 °F) (non condensing)
- Altitude: from 0 to 4,000 m (13,123 ft) derating of maximum operating temperature by 0.6 °C (33 °F) per 100 m between 1,000 and 4,000 m (3,280 and 13,123 ft)
- Vibrations: IEC 60068-2-6
- 2 Safe Torque Off inputs: complies with EN 61800-5-2, with 2 separate channel logic
- Inputs/Outputs: IEC 61131-2
- Harmonics: IEC 61000-3-12
- Electromagnetic immunity complies with EN 61800-3 and EN 61000-6-2 standards
- Emissions: EN 61800-3 category C2 (EN 55011, A limit, group 1) or category C1 with option filter (EN 55011, B limit, group 1)

Accessories

RFI filter

for C1 compliance

Communication

MDX-Bus
CM-Bus

Modbus TCP/IP
ETHERNET
MDX-ETHERNET
CM-ETHERNET

MDX-PROFIBUS-DP
CM-PROFIBUS-DP

MDX-MODBUS
CM-MODBUS

EtherNet/IP
MDX-ETHERNET-IP
CM-ETHERNET-IP

PROFINET
MDX-PROFINET
CM-PROFINET

CANopen
MDX-CANOPEN
CM-CANOPEN

Operator interface

MDX-USB-ISOLATOR

MDX-KEYPAD

3 line external
LCD display

MDX-POWERSCREEN

Outstanding
panel mount HMI
Touch sensitive
color screen

MDX-SOFT
Download from
www.leroy-somer.com

Application options*

9 additional inputs/outputs
2 relay outputs
RJ45 port for EtherNet/IP
Data logger
PT100 or KTY sensor
management

MDX-I/O-LITE

MDX-IO-M2M

Environmental options

IP 54 (NEMA 12),
Through-panel
mounting

Liquid or
cold plate
cooling

Cubicle mounting

Protection & safety devices

PTC sensor management

Feedback options*

MDX-ENCODER

MDX-RESOLVER

*Compacts Modules CM available

Gearboxes

Axial output

Helical gears

Parallel output

Helical gears

Right-angle output

Helical bevel
gears

Motors

Asynchronous

IE2, IE3 and IE4 efficiency
IP 55, IP 23
Cast iron, aluminum
or steel housing

Suitable for variable speed
IP 23
Steel housing

Synchronous permanent magnet

Efficiency exceeding
IE4/NEMA super
premium requirements
IP 55, IP 23
Aluminum housing

Motor options

Mechanical brakes
Speed / position feedback
Incremental encoder with or
without commutation channels
Resolver

For more information,
contact Leroy-Somer

Ratings and dimensions

Power				Output current[1]				Model	Dimensions[2]			Weight[2]
				continuous		available for 60 s						
Duty				Duty								
heavy		normal		heavy	normal	heavy	normal		H	W	D	
kW	hp	kW	hp	A	A	A	A		mm/in	mm/in	mm/in	kg/lb
22	30	30	40	45	59	68	64	33T	587 23.1	256 10.1	240 9.4	20 44.1
30	40	37	50	59	73	89	79	40T				
37	50	45	60	73	86	105	95	50T				
45	60	55	75	92	110	135	119	60T	788 36.0	250 9.8	301 11.9	37 81.6
55	75	75	100	110	145	165	157	75T				
75	100	90	125	145	175	200	189	100T				

[1] values stated for a voltage of 400 V
[2] without options

Powerdrive FX
Benefits

Installation cost savings

- No braking resistor or overload relay required
- Integrated line reactor
- C2 category RFI filter as standard
- Significant reduction of enclosure dimensions
- Sensorless Permanent Magnet motor control
- Size reduction of components on power supply side

Operating and maintenance cost savings

- Increased productivity: dynamic braking
- Increased serviceability
- No stress on motor windings
- Higher efficiency
- Energy saving: regenerative drive

Better environmental protection

- No electrolytic capacitors
- Recyclable components

Specific environment

- Wood industry: log carriage, circular or band saws
- Textile industry: recycling machines, drums

Specific benefits:

- Increased safety: elimination of fire risk in a flammable dust environment, no braking resistors are required
- Adaptation to environment: possibility to eliminate the fan by using liquid cooling

- **Global Solution: TEFC Dyneo® permanent magnet motor range with high power to weight ratio**

Permanent or cyclic braking

- Test bench

Specific benefits:

- High resolution speed loop
- Control of high speed motors
- Resolver feedback
- Competitiveness compared to an Active Front End solution

- **Global Solution: wide speed range of CPLS high speed motors**

Material handling

- Overhead crane, gantry crane: hoist, trolley, translation, stacker (bulk products)...

Specific benefits:

- Ultra compact solution
- On board weight reduction
- Smooth operation
- High performance brake management
- Control optimization (crane)

- **Flexible global Solution: choice of gearbox technology and mounting, braked or unbraked adapted motor**
- **High efficiency offering**

High inertia

- Machine tool retrofit (spindle, lathe)
- Centrifuge, decanter, separator ...

Specific benefits:

- Quick stopping
- Duty cycle machine optimization
- Reduction of commissioning time
- Product gains: quick maintenance made possible without penalizing the production
- Speed precision: high resolution speed loop: 0.01 rpm

- **Ultra compact and light global Solution:**
- **Easier integration into machine: rotor / stator solution with permanent magnet technology**
- **CPLS motor range with wide speed range**

Ventilation for critical applications

- Tunnel: fan can be driven by air flow

Specific benefits:

- Secure running (smoke extraction...): protection disabled
- Quick air flow direction change
- Low speed performance preserved
- Wall footprint reduction: highly compact

- **Dedicated global Solution:**
- **Smoke extraction motor range complying with EN12101-3 standards**
- **High efficiency and compact Dyneo® motor range**

Variable load applications

- Stamping press, piston pump, beam pump

Specific benefits:

- Drive rating equivalent to the motor power (drive oversizing necessary with conventional 6 pulse solution)
- Energy optimization

- **Ultra compact global Solution for modernization:**
- **High efficiency Dyneo® motor range**

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All for dreams

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