

Fact Sheet

Mount your drive where you want to... not where you have to

**NEMA/UL
Type
4X/3R**

VLT[®]
AutomationDrive



Danfoss FC series can withstand even the harshest pressure washing environments. A NEMA/UL Type 4X rated enclosure provides maximum mounting flexibility

Outdoor installation

Many VLT® drives are installed outdoors therefore 4x ratings are available for FC series up to 90 kW and NEMA 3R up to 250 kW. NEMA is a technical standard from the National Electrical Manufacturers Association (NEMA).

This standard, unlike the IP classification, includes reliability testing under specific weather conditions for certain classes. For example, the unit is exposed to a water spray until ice forms on the exterior. Prolonged exposure to salt spray is also tested.

Improved reliability

As with the IP ratings, the user can use specific NEMA ratings to decide the suitability of the unit for certain environmental conditions – although the unit's base specification always remain valid, Danfoss offers a protective weather shield to prevent air vents becoming blocked by leaves or other debris. The LCP is also protected against UV – as is the whole enclosure.

3rd party testing

The FC-Series has received certification from an independent body, Underwriters Laboratories (UL) and has achieved Type 4X approval up to 90 kW and NEMA 3R up to 250 kW. For details, including Type 3R, refer to drive documentation.

Approved series

- VLT® HVAC Drive FC 102
- VLT® Refrigeration Drive FC 103
- VLT® AQUA Drive FC 202
- VLT® AutomationDrive FC 301/302

The perfect solution for demanding applications, such as:

- Air handlers
- Pump stations
- Cooling towers
- Other outdoor applications

Power range NEMA 4X

- 200 V range: up to 45 kW
- 400 V range: up to 90 kW
- 575 V range: up to 90 kW
- 690 V range: up to 90 kW

Power range NEMA 3R

- 200 V up to 45 kW
- 400 V up to 315 kW
- 460 V up to 450 hp
- 575 V up to 400 hp
- 690 V up to 400 kW

NEMA 250 Standard

Type 3R

Enclosures constructed for either indoor or outdoor use. Protection against rain, sleet, snow. Will be undamaged by external formation of ice on the enclosure. Due to a drain hole, the class is comparable to IP 23.

NEW!

One of the smallest NEMA 3R solutions for drives from 55-400 kW is now available.

To achieve the NEMA 3R rating, the drive must be ordered with an "E5S" enclosure, which includes an anti-condensation heater and stainless steel screws on the outside of the drive. The corresponding kits must be ordered

to complete the protection. The kit consists of the cover (with rain hood and air baffle), special gland plate, and cover vent plate.

Type 4X

Enclosures constructed for either indoor or outdoor use. Protection against windblown rain, sleet, snow, splashing water and hose directed water. Will be undamaged by external formation of ice on the enclosure.

Type 4X is also used inside, where equipment is washed with soap/solvents. Reliability tested under specific weather conditions, including water spraying until ice forms on the exterior and prolonged exposure to salt spray. This class is comparable to IP 66.

Comparison of NEMA ratings

Provides a degree of protection against the following conditions	Type of enclosure									
	1*	2*	4	4X	5	6	6P	12	12K	13
Access to hazardous parts	■	■	■	■	■	■	■	■	■	■
Ingress of solid foreign objects (falling dirt)	■	■	■	■	■	■	■	■	■	■
Ingress of water (dripping and light splashing)	-	■	■	■	■	■	■	■	■	■
Ingress of solid foreign objects (circulation dust, lint, fibres and flyings**)	-	-	■	■	-	■	■	■	■	■
Ingress of solid foreign objects (settling airborne dust, lint, fibres and flyings**)	-	-	■	■	■	■	■	■	■	■
Ingress of water (hose-down and splashing water)	-	-	■	■	-	■	■	-	-	-
Oil and coolant seepage	-	-	-	-	-	-	-	■	■	■
Oil or coolant spraying and splashing	-	-	-	-	-	-	-	-	-	■
Corrosive agents	-	-	-	■	-	-	■	-	-	-
Ingress of water (occasional temporary submersion)	-	-	-	-	-	■	■	-	-	-
Ingress of water (occasional prolonged submersion)	-	-	-	-	-	-	■	-	-	-

* These enclosures may be ventilated.

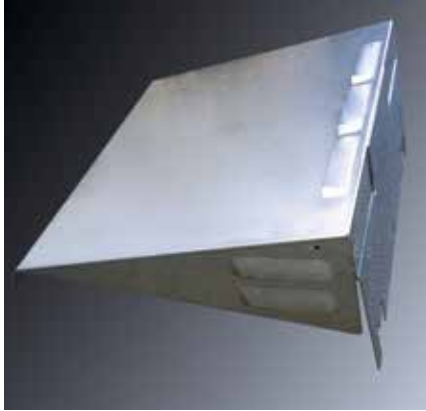
** These fibres and filings are non-hazardous materials and are not considered Class III type ignitable fibres or combustible filings. For Class III type ignitable fibres or combustible filings see the National Electrical Code, Article 500.

Provides a degree of protection against the following conditions	Type of enclosure									
	3	3X	3R*	3RX*	3S	3SX	4	4X	6	6P
Access to hazardous parts	■	■	■	■	■	■	■	■	■	■
Ingress of water (rain, snow and sleet**)	■	■	■	■	■	■	■	■	■	■
Sleet***	-	-	-	-	■	■	-	-	-	-
Ingress of solid foreign objects (windblown dust, lint, fibres and flyings)	■	■	-	-	■	■	■	■	■	■
Ingress of water (hose-down)	-	-	-	-	-	-	■	■	■	■
Corrosive agents	-	■	-	■	-	■	-	■	-	■
Ingress of water (occasional temporary submersion)	-	-	-	-	-	-	-	-	■	■
Ingress of water (occasional prolonged submersion)	-	-	-	-	-	-	-	-	-	■

* These enclosures may be ventilated.

** External operating mechanisms are not required to be operable when the enclosure is ice covered.

*** External operating mechanisms are operable when the enclosure is ice covered.



Outdoor weather shield

Designed to be mounted above the VLT® drive to protect from direct sun, snow and falling debris.

Ordering number

Frame A4, A5, B1, B2.....	130B4598
Frame C1, C2	130B4597
D1h	176F6302
D2h	176F6303



Stainless steel back plate

Used to direct air from the fan through the rear heat sink. This is required when drive is not mounted against a flat surface, panel, or wall.



Watertight USB plug

A USB plug can be mounted in the base of the enclosure, allowing the drive to stay closed while making setup or programming changes using MCT 10 setup software.

Ordering number

Frame A4, A5, B1	130B1155
Frame B2, C1, C2	130B1156



Kit ordering codes

Ordering number

D1h	176F6302
D2h	176F6303

Danfoss Drives, 4401 N. Bell School Rd., Loves Park, IL 61111, Tel. 1-888-DANFOSS, www.danfossdrives.com

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