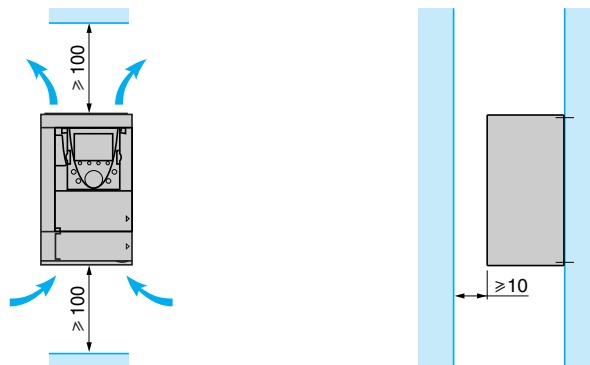


Mounting recommendations

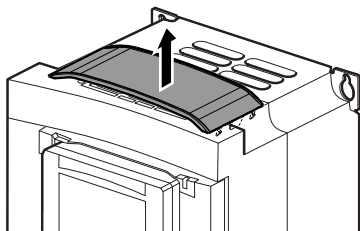
Depending on the conditions in which the drive is to be used, its installation will require certain precautions and the use of appropriate accessories.
Install the unit vertically:

- Do not place it close to heating elements.
- Leave sufficient free space to ensure that the air required for cooling purposes can circulate from the bottom to the top of the unit.

ATV 71H●●●M3, ATV 71HD11M3X...HD45M3X, ATV 71H075N4...HD75N4, P075N4Z...PU75N4Z

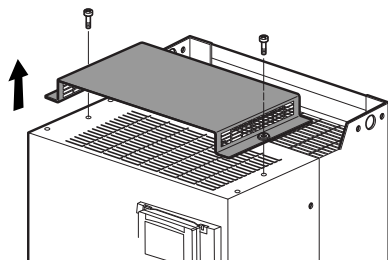


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Removing the protective blanking cover for:
ATV 71H●●●M3, ATV 71HD11M3X, HD15M3X,
ATV 71H075N4...HD18N4,
ATV 71P075N4Z...PU75N4Z

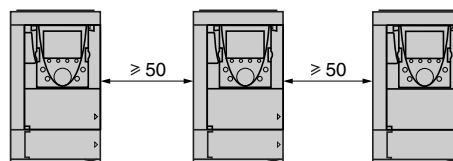
564610



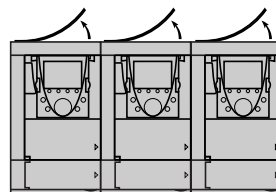
Removing the protective blanking cover for:
ATV 71HD18M3X...HD45M3X,
ATV 71HD22N4...HD75N4

Mounting types

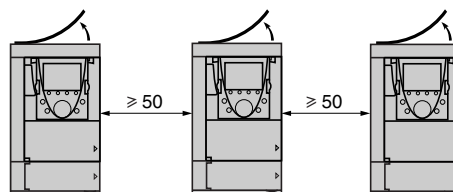
■ Type A mounting



■ Type B mounting



■ Type C mounting



By removing the protective blanking cover from the top of the drive, the degree of protection for the drive becomes IP 20.

The protective blanking cover may vary according to the drive model, see drawings opposite.

Note: The protective blanking cover must be removed from ATV 71P●●●N4Z drives when they are mounted in a dust and damp proof enclosure.

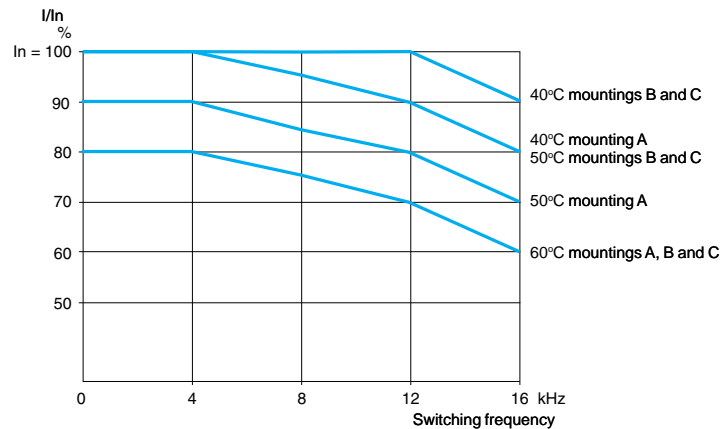
Mounting recommendations (continued)

Derating curves

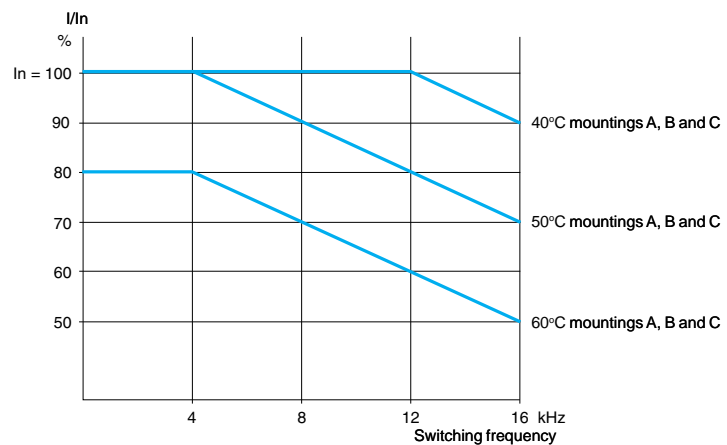
The derating curves for the drive nominal current (I_n) depend on the temperature, the switching frequency and the mounting type.

For intermediate temperatures (55°C for example), interpolate between 2 curves.

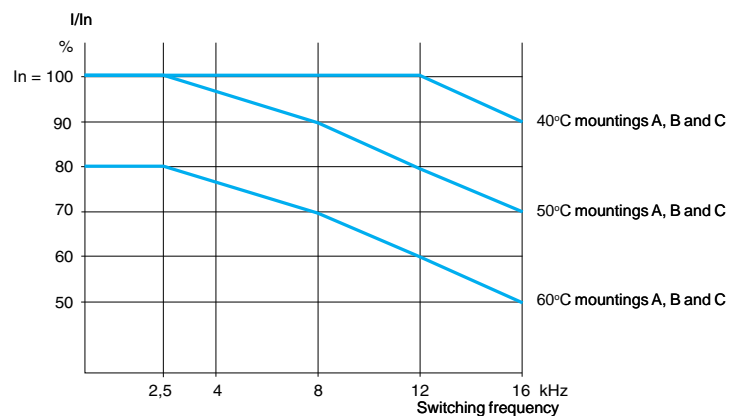
ATV 71H037M3...HD15M3X et ATV 71H075N4...HD18N4 and ATV 71P075N4Z...PU75N4Z



ATV 71HD22N4 and ATV 71HD30N4 (1)



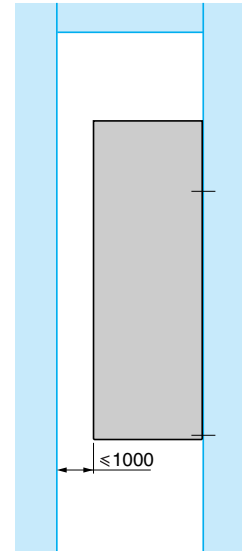
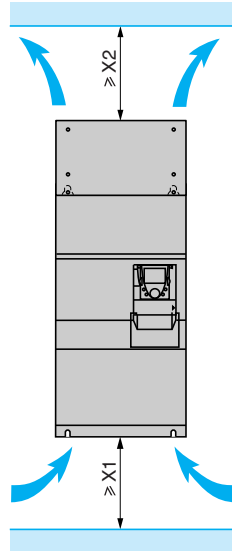
ATV HD18M3X...HD45M3X and ATV 71HD37N4...HD75N4 (1)



(1) Above 50°C, IATV 71HD18M3X...HD45M3X et ATV 71HD22N4...HD75N4 drives should be fitted with a control card fan kit. See page 60283/2.

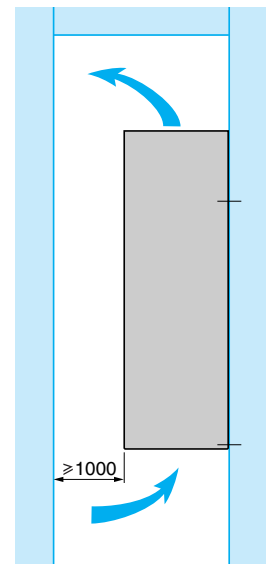
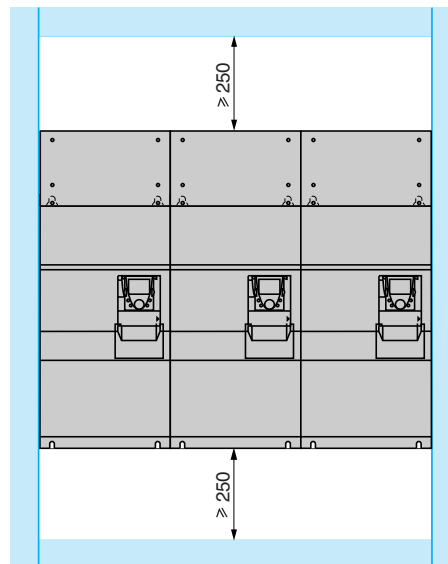
Mounting recommendations (continued)

ATV 71HD55M3X, HD75M3X, ATV 71HD90N4...HC50N4



ATV 71H	X1	X2
D55M3X, D75M3X D90N4	100	100
C11N4...C16N4	150	150
C20N4...C28N4	150	200
C31N4, C40N4	250	300
C50N4	250	400

These drives can be mounted side by side, observing the following mounting recommendations:



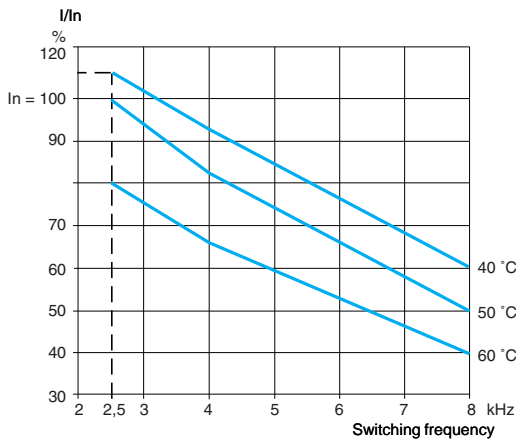
Mounting recommendations (continued)

Derating curves

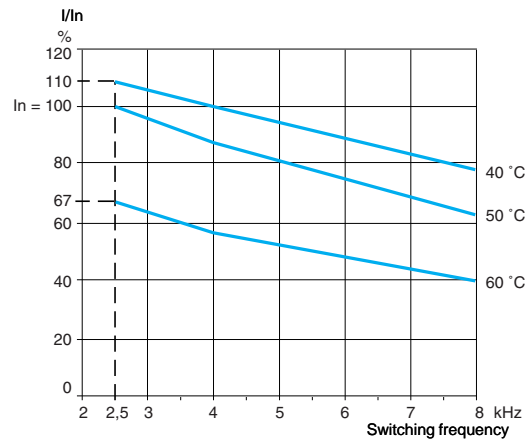
The derating curves for the drive nominal current (I_n) depend on the temperature, the switching frequency and the mounting type.

For intermediate temperatures (55°C for example), interpolate between 2 curves.

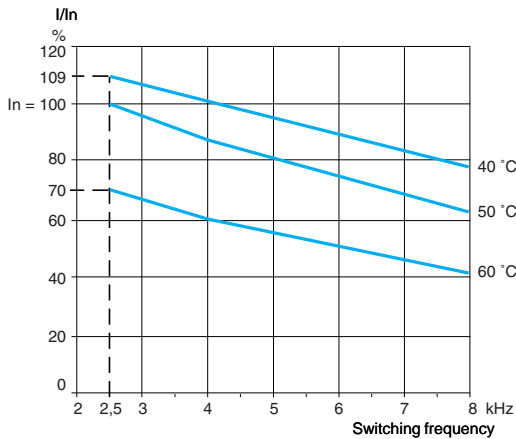
ATV 71HD55M3X, HD75M3X



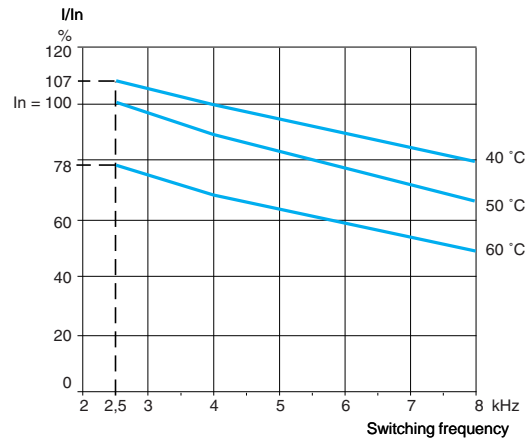
ATV 71HD90N4



ATV 71HC11N4



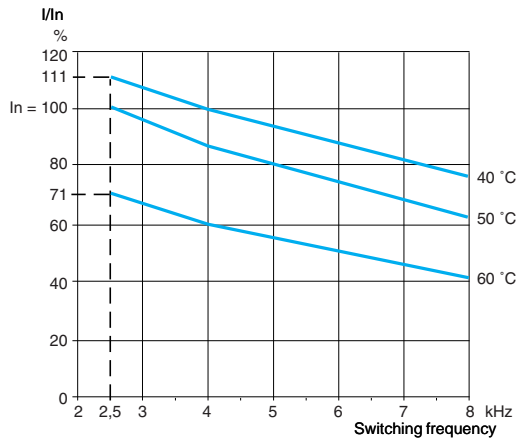
ATV 71HC13N4



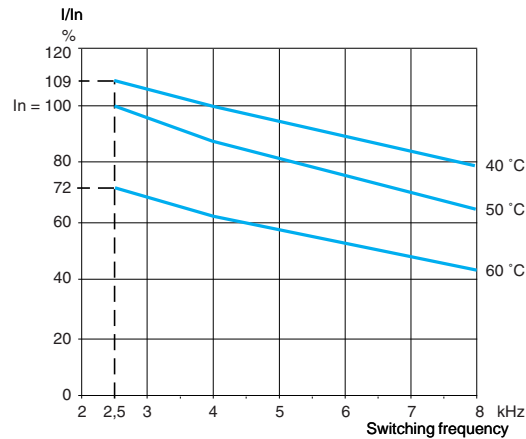
Mounting recommendations (continued)

Derating curves

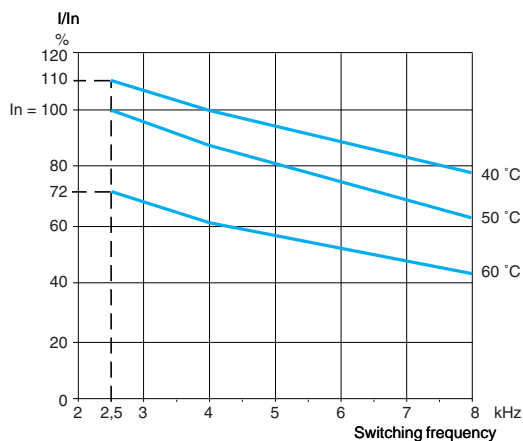
ATV 71HC16N4



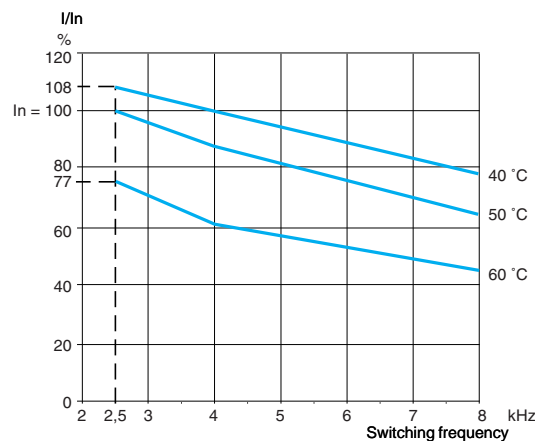
ATV 71HC20N4



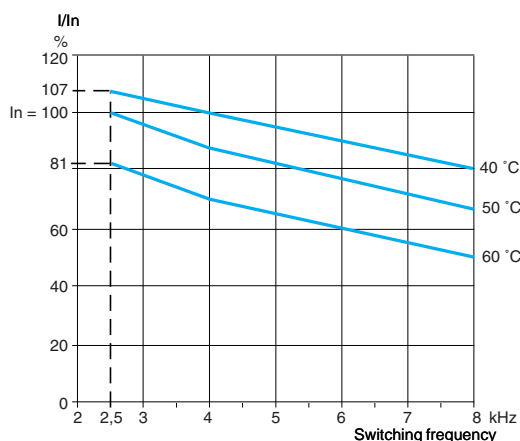
ATV 71HC25N4 combined with a 220 kW motor



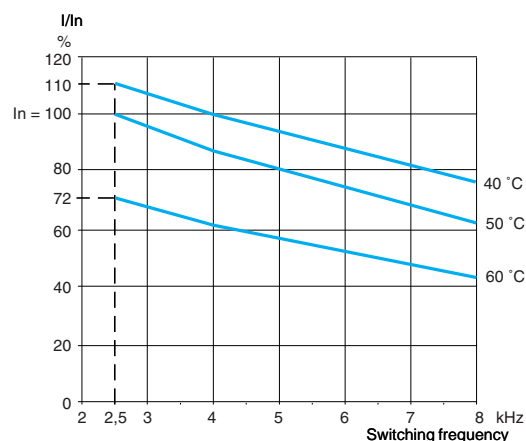
ATV 71HC25N4 combined with a 250 kW motor



ATV 71HC28N4



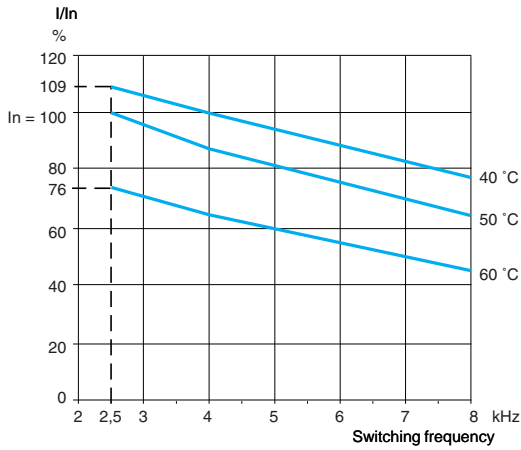
ATV 71HC31N4



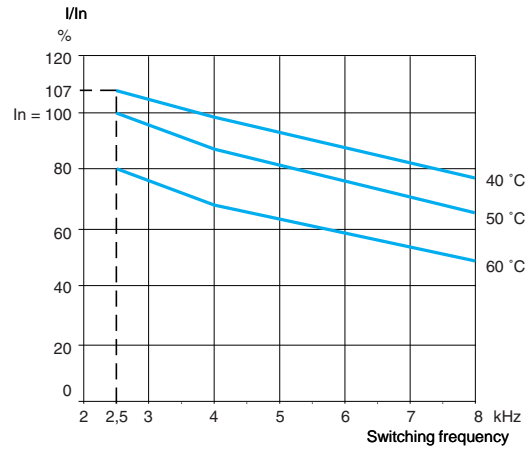
Mounting recommendations (continued)

Derating curves

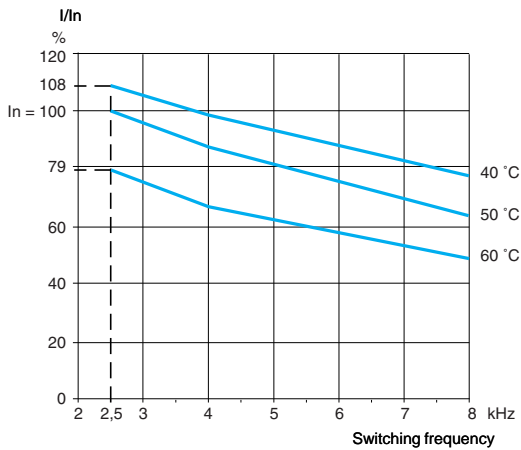
ATV 71HC40N4 combined with a 355 kW motor

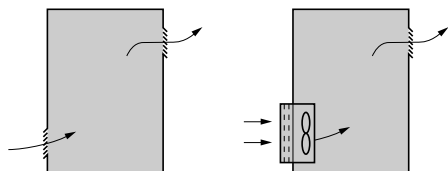


ATV 71HC40N4 combined with a 400 kW motor



ATV 71HC50N4





Specific recommendations for mounting ATV 71H●●●M3, ATV 71H●●●M3X and ATV 71H●●●N4 drives in enclosures

Observe the mounting recommendations described on pages 60297/2 to 60297/7.

To ensure proper air circulation in the drive:

- Fit ventilation grilles
- Ensure that there is sufficient ventilation. If there is not, install a forced ventilation unit with a filter. The openings and/or fans must provide a flow rate at least equal to that of the drive fans (see page 60297/11).
- Use special filters with IP 54 protection
- Remove the blanking cover from the top of the drive (see page 60297/2).

Power dissipated inside the enclosure

For drives	Dissipated power (1)	
	Mounted in the enclosure (power section inside the enclosure) W	Dust and damp proof flush-mounted (power section outside the enclosure) W
3-phase supply voltage: 200...240 V 50/60 Hz		
ATV 71H037M3	46	25
ATV 71H075M3	66	27
ATV 71HU15M3	101	30
ATV 71HU22M3	122	38
ATV 71HU30M3	154	38
ATV 71HU40M3	191	41
ATV 71HU55M3	293	59
ATV 71HU75M3	363	67
ATV 71HD11M3X	566	80
ATV 71HD15M3X	620	84
ATV 71HD18M3X	657	114
ATV 71HD22M3X	766	124
ATV 71HD30M3X	980	144
ATV 71HD37M3X	1154	161
ATV 71HD45M3X	1366	180
ATV 71HD55M3X	1715	154
ATV 71HD75M3X	2204	154

3-phase supply voltage: 380...480 V 50/60 Hz

ATV 71H075N4	44	26
ATV 71HU15N4	64	28
ATV 71HU22N4	87	30
ATV 71HU30N4	114	35
ATV 71HU40N4	144	40
ATV 71HU55N4	185	50
ATV 71HU75N4	217	55
ATV 71HD11N4	320	65
ATV 71HD15N4	392	85
ATV 71HD18N4	486	86
ATV 71HD22N4	574	110
ATV 71HD30N4	799	133
ATV 71HD37N4	861	137
ATV 71HD45N4	1060	165
ATV 71HD55N4	1210	178
ATV 71HD75N4	1720	225
ATV 71HD90N4	2403	237
ATV 71HC11N4	2726	261
ATV 71HC13N4	3191	296
ATV 71HC16N4	3812	350
ATV 71HC20N4	4930	493
ATV 71HC25N4	5873	586
ATV 71HC28N4	6829	658
ATV 71HC31N4	7454	772
ATV 71HC40N4	9291	935
ATV 71HC50N4	11345	1116

(1) This value is given for operation at nominal load and for a switching frequency of 2.5 or 4 kHz depending on the rating.

Add 7 W to this value for each additional option card.

Fan flow rate depending on the drive rating

For drive	Flow rate m ³ /hour
ATV 71H037M3...HU15M3, ATV 71H075N4...HU22N4	17
ATV 71HU22M3...HU40M3, ATV 71HU30N4, HU40N4	56
ATV 71HU55M3, ATV 71HU55N4, HU75N4	112
ATV 71HU75M3, ATV 71HD11N4	163
ATV 71HD11M3X, HD15M3X ATV 71HD15N4, HD18N4	252
ATV 71HD18M3X, HD22M3X, ATV 71HD22N4	203
ATV 71HD30N4, HD37N4	203
ATV 71HD30M3X...HD45M3X	406
ATV 71HD45N4...HD75N4	406
ATV 71HD55M3X, ATV 71HD90N4	402
ATV 71HD75M3X, ATV 71HC11N4	774
ATV 71HC13N4	745
ATV 71HC16N4	860
ATV 71HC20N4... HC28N4	1260
ATV 71HC31N4, HC40N4	2100
ATV 71HC50N4	2400

Sealed metal enclosure (IP 54 degree of protection)

The drive must be mounted in a dust and damp proof casing in certain environmental conditions: dust, corrosive gases, high humidity with risk of condensation and dripping water, splashing liquid, etc.

This enables the drive to be used in an enclosure where the maximum internal temperature reaches 50°C.

Calculating the enclosure dimensions

Maximum thermal resistance R_{th} (°C/W)

$$R_{th} = \frac{\theta - \theta_e}{P}$$

θ = maximum temperature inside enclosure in °C
 θ_e = maximum external temperature in °C
 P = total power dissipated in the enclosure in W

Power dissipated by drive: see page 60297/8 (mounting in an enclosure or flush-mounting in an enclosure).

Add the power dissipated by the other equipment components.

Useful heat dissipation surface of enclosure S (m²)

(sides + top + front panel if wall-mounted)

$$S = \frac{K}{R_{th}}$$

K = enclosure thermal resistance per m²

For a metal enclosure:

- K = 0.12 with internal fan
- K = 0.15 without fan

Note: Do not use insulated enclosures, as they have a poor level of conductivity.

Specific recommendations for mounting drives on base plates in a dust and damp proof enclosure or on a machine frame

Observe the mounting recommendations described on pages 60297/2 and 60297/3.

Power dissipated inside the enclosure

For drives	Dissipated power (1)	
	Mounted in the enclosure with no fan (2)	Mounted in the enclosure with a fan
	W	W
3-phase supply voltage: 380...480 V 50/60 Hz		
ATV 71P075N4Z	26	39
ATV 71PU15N4Z	28	41
ATV 71PU22N4Z	30	43
ATV 71PU30N4Z	35	65
ATV 71PU40N4Z	37	67
ATV 71PU55N4Z	40	95
ATV 71PU75N4Z	40	95

Specific recommendations for mounting in a dust and damp proof enclosure

Drives on base plates can be mounted in a dust and damp proof enclosure in accordance with the following specific recommendations:

- External ambient temperature (heatsink side, see page 60283/4): -10...+40°C
- Temperature inside the enclosure: +40°C for a switching frequency of 4 kHz, or +50°C for a switching frequency of 12 kHz
- Remove the blanking cover from the top of the drive, see page 60297/2.

Specific recommendations for mounting on a machine frame

Drives on base plates can also be mounted on a machine frame in accordance with the following specific recommendations:

- Ambient temperature: -10...+40°C
- Thermal resistance (Rth) of the frame smaller than or equal to the thermal resistance of the kit for mounting in a dust and damp proof enclosure VW3 A980● (see page 60283/4)
- Aluminium machine frame; mounting on iron frame not recommended
- Support area machined on the frame, to give a surface smoothness of 100 µm and unevenness of 3.2 µm maximum
- Heatsink mounted in the centre of the support with a minimum thickness and a minimum cooling area, exposed to the open air (see table below).

Drives	Switching frequency	Minimum area		Minimum thickness mm
		With DC choke m ²	With fan m ²	
ATV 71P075N4Z	4 kHz	–	–	20
...PU22N4Z	12 kHz	0.60	0.70	20
ATV 71PU30N4Z, PU40N4Z	4 kHz	1.50	–	20
	12 kHz	2.00	1.50	20
ATV 71PU55N4Z, PU75N4Z	4 kHz	3.50	3.00	20
	12 kHz	5.40	5.00	20

(1) This value is given for operation at nominal load and for a switching frequency of 4 kHz.

Add 7 W to this value for each additional option card.

(2) Add the dissipation of the DC choke, see page 60289/5.

Calculating the thermal resistance

Thermal resistance Rth of the machine frame or base plate (°C/W)

For drive	Rth maximum (°C/W)
ATV 71P075N4Z	0.65
ATV 71PU15N4Z	0.36
ATV 71PU22N4Z	0.24
ATV 71PU30N4Z	0.21
ATV 71PU40N4Z	0.15
ATV 71HPU55N4Z	0.03
ATV 71PU75N4Z	0.02

Mounting several drives on the same frame or the same cold plate

Determine the equivalent thermal resistance (Rthe) for all the drives:

$$\frac{1}{R_{the}} = \frac{1}{R_{th1}} + \frac{1}{R_{th2}} + \frac{1}{R_{th3}} + \dots + \frac{1}{R_{thn}}$$

Calculation example with three drives of 0.75 kW, 1.5 kW and 2.2 kW

$$\frac{1}{R_{th}} = \frac{1}{0.65} + \frac{1}{0.36} + \frac{1}{0.24} \quad R_{th} = 0.12 \text{ °C/W.}$$

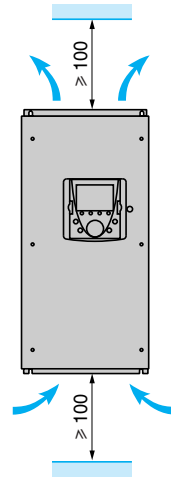
Mounting recommendations

Depending on the conditions in which the drive is to be used, its installation will require certain precautions and the use of appropriate accessories.

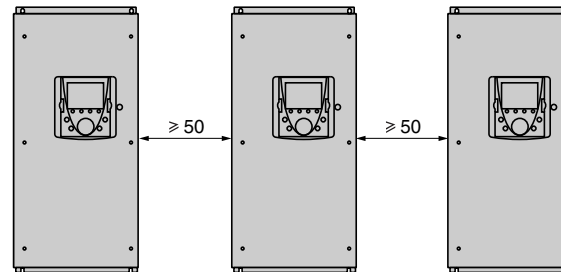
Install the unit vertically:

- Do not place it close to heating elements
- Leave sufficient free space to ensure that the air required for cooling purposes can circulate from the bottom to the top of the unit.

ATV 71W●●●N4

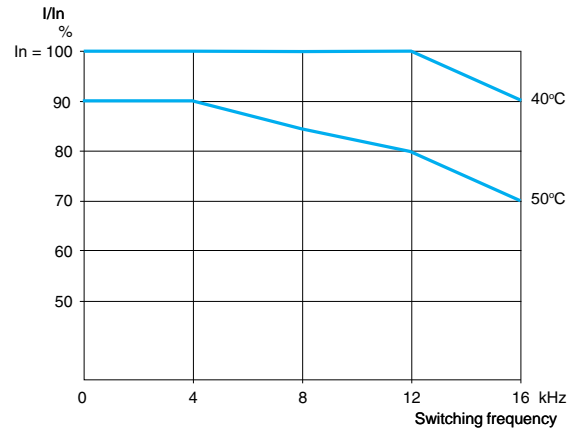


Mounting

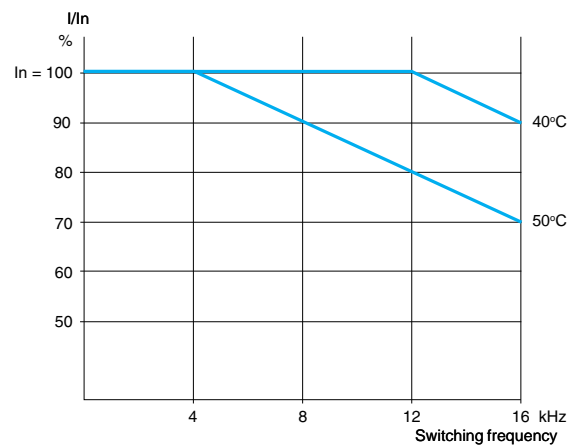


Derating curves

ATV 71W075N4...WD18N4



ATV 71WD22N4, WD30N4



ATV 71WD37N4...WD75N4

