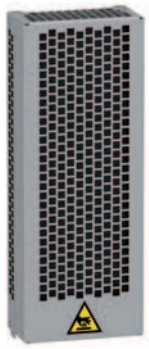
Variable speed drives
Altivar Process ATV900
Option: Braking resistors

Presentation

PF151255



VW3A7741

Braking resistors allow Altivar Process drives to operate while braking to a standstill, by dissipating the braking energy. They enable maximum transient braking torque.

Braking resistors are designed to be located outside the enclosure, but should not inhibit natural cooling. Air inlets and outlets must not be obstructed in any way. The air must be free of dust, corrosive gas, and condensation.

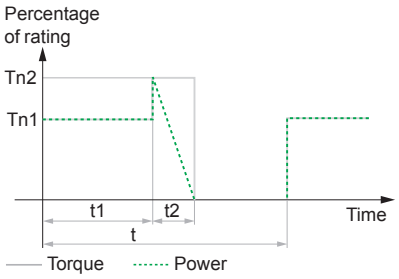
Several resistor models are available, depending on the drive rating:
- With IP 20 and IP 23 casing and thermal protection provided by temperature-controlled switch or by the drive

The internal circuits of Altivar Process drives rated 90 kW or less have a built-in dynamic brake transistor.

An external braking unit is necessary for wall-mounting Altivar Process drives between 110 kW and 315 kW at 400...480 V as well as 55 kW and 75 kW at 200...240 V.

Applications

Braking resistors are designed for a defined cycle (see the 3 cycle types defined below). Depending on your own applications and cycles, you can use these resistors or define a new value.
- Braking resistors for light braking cycles for machines with cycles and inertia. The braking power is limited to 1.5 Tn for 0.8 s every 40 s.
- Braking resistors for medium braking cycles for machines with high inertia and conveyors. The braking power is limited to 1.35 Tn for 4 s every 40 s.
- Braking resistors for severe braking cycles for machines with very high inertia and vertical movements (hoisting). The braking power is limited to 1.65 Tn for 6 s and Tn for 54 s every 120 s.



Light Cycle	
t = 40 s	*t: period*
t1 = 0 s	*Tn1: braking torque*
t2 = 0.8 s	*Tn2: braking torque*
Tn1 = 0	*Tn: nominal torque*
Tn2 = 1.5 x Tn	

References for a light braking cycle

For drives	Degree of protection of the resistor	Ohmic value at 20 °C/ *68 °F*	Average power available at 50 °C/ *122 °F (1)*	Quantity required per drive	Reference	Weight
		Ω	kW			kg/*lb*
Supply voltage: 200…240 V or 380…480 V 50/60 Hz						
ATV930U07M3 ATV930U07N4…U40N4 ATV950U07N4…U40N4 ATV950U07N4E…U40N4E	IP20	100	0.1	1	**VW3A7730**	1.500/ 3.307
ATV930U15M3…U22M3 ATV930U55N4…U75N4 ATV950U55N4…U75N4 ATV950U55N4E…U75N4E	IP20	60	0.16	1	**VW3A7731**	2.000/ *4.409*
ATV930U30M3…U40M3 ATV930D11N4…D15N4 ATV950D11N4…D15N4 ATV950D11N4E…D15N4E	IP20	28	0.3	1	**VW3A7732**	3.000/ *6.614*
ATV930U55M3…U75M3 ATV930D18N4...D30N4 ATV950D18N4...D30N4 ATV950D18N4E...D30N4E	IP20	16	1.1	1	**VW3A7733**	4.000/ *8.818*
ATV930D11M3 ATV930D37N4...D45N4 ATV950D37N4...D45N4 ATV950D37N4E...D45N4E	IP20	10	1.1	1	**VW3A7734**	5.500/ *12.125*
ATV930D15M3 ATV930D55N4 ATV950D55N4 ATV950D55N4E	IP20	8	1.1	1	**VW3A7735**	5.500/ *12.125*
ATV930D18M3…D22M3 ATV930D75N4...D90N4 ATV950D75N4...D90N4 ATV950D75N4E...D90N4E	IP23	5	1.9	1	**VW3A7736**	18.000/ *39.683*
ATV930D30M3…D45M3 ATV930C11N4C...C16N4C	IP23	2.5	3.2	1	**VW3A7737**	21.000/ *46.297*
ATV930C31N4C	IP23	2.5	3.2	2		
ATV930D55M3C...D75M3C	IP23	1.4	1.5	1	**VW3A7738**	16.000/ *35.274*
ATV930C22N4 ATV930C25N4C	IP23	1.4	5.1	1	**VW3A7748**	29.000/ *69.934*

(1) Load factor for resistors: The value of the average power that can be dissipated at 50 °C/122 °F from the resistor into the casing is determined for a load factor during braking that corresponds to the majority of normal applications:
- *Normal duty: 0.8 s braking with a 1.2 Tn braking torque for a 40 s cycle*
- *Heavy duty: 0.8 s braking with a 1.5 Tn braking torque for a 40 s cycle*

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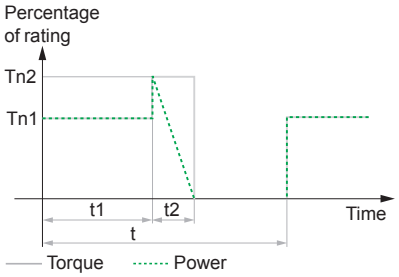

Medium Cycle	
t = 40 s	*t: period*
t1 = 0 s	*Tn1: braking torque*
t2 = 4 s	*Tn2: braking torque*
Tn1 = 0	*Tn: nominal torque*
Tn2 = 1.35 x Tn	

References for a medium braking cycle

For drives	Degree of protection of the resistor	Ohmic value at 20 °C/ *68 °F*	Average power available at 50 °C/ *122 °F (1)*	Quantity required per drive	Reference	Weight
		Ω	kW			kg/*lb*
Supply voltage: 200…240 V or 380…480 V 50/60 Hz						
ATV930U07M3 ATV930U07N4...U15N4 ATV950U07N4…U15N4 ATV950U07N4E…U15N4E	IP20	100	0.1	1	**VW3A7730**	1.500/ *3.307*
ATV930U15M3...U22M3	IP20	60	0.16	1	**VW3A7731**	2.000/ *4.409*
ATV930U30M3...U40M3	IP20	28	0.3	1	**VW3A7732**	3.000/ *6.614*
ATV930U55M3…U75M3	IP20	16	1.1	1	**VW3A7733**	4.000/ *8.818*
ATV930D11M3	IP20	10	1.1	1	**VW3A7734**	5.500/ *12.125*
ATV930D15M3	IP20	8	1.1	1	**VW3A7735**	5.500/ *12.125*
ATV930D18M3...D22M3	IP23	5	1.9	1	**VW3A7736**	18.000/ *39.684*
ATV930D30M3...D45M3	IP23	2.5	3.2	1	**VW3A7737**	20.000/ *44.092*
ATV930U22N4...U40N4 ATV950U22N4...U40N4 ATV950U22N4E...U40N4E	IP20	100	0.26	1	**VW3A7740**	2.500/ *5.512*
ATV930U55N4...U75N4 ATV950U55N4...U75N4 ATV950U55N4E...U75N4E	IP20	60	0.5	1	**VW3A7741**	4.500/ *9.921*
ATV930D11N4...D15N4 ATV950D11N4...D15N4 ATV950D11N4E...D15N4E	IP20	28	1.1	1	**VW3A7742**	4.000/ *8.818*
ATV930D18N4...D30N4 ATV950D18N4...D30N4 ATV950D18N4E...D30N4E	IP20	16	2.2	1	**VW3A7743**	7.000/ *15.432*
ATV930D37N4...D45N4 ATV950D37N4...D45N4 ATV950D37N4E...D45N4E	IP20	10	3.4	1	**VW3A7744**	11.500/ *25.353*
ATV930D55N4 ATV950D55N4 ATV950D55N4E	IP23	8	3.8	1	**VW3A7745**	23.000/ *50.706*
ATV930D75N4...D90N4 ATV950D75N4...D90N4 ATV950D75N4E...D90N4E	IP23	5	6.9	1	**VW3A7746**	27.000/ *59.525*
ATV930C11N4C...C16N4C	IP23	2.5	11	1	**VW3A7747**	43.000/ *94.799*
ATV930D55M3C...D75M3C	IP23	1.4	5.1	1	**VW3A7748**	25.000/ *55.116*
ATV930C22N4 ATV930C25N4C...C31N4C	IP23	1.4	29	1	**VW3A7757**	121.000/ *69.934*

(1) Load factor for resistors: The value of the average power that can be dissipated at 50 °C/122 °F from the resistor into the casing is determined for a load factor during braking that corresponds to the majority of normal applications:
- *Normal duty: 4 s braking with a 1.35 Tn braking torque for a 40 s cycle*
- *Heavy duty: 4 s braking with a 1.65 Tn braking torque for a 40 s cycle*

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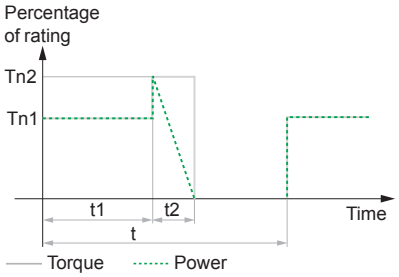

Severe Cycle	
t = 120 s	*t: period*
t1 = 54 s	*Tn1: braking torque*
t2 = 6 s	*Tn2: braking torque*
Tn1= Tn	*Tn: nominal torque*
Tn2= 1.65 x Tn	

References for a severe braking cycle (hoisting applications)

For drives	Degree of protection of the resistor	Ohmic value at 20 °C/ *68 °F*	Average power available at 50 °C/ *122* °F *(1)*	Quantity required per drive	Reference	Weight
		Ω	kW			kg/*lb*
Supply voltage: 200…240 V or 380…480 V 50/60 Hz						
ATV930U07M3	IP20	100	0.26	1	**VW3A7740**	2.500/ *5.512*
ATV930U15M3	IP20	60	0.5	1	**VW3A7741**	4.500/ *9.921*
ATV930U22M3	IP20	60	3.4	1	**VW3A7751**	10.000/ *22.046*
ATV930U30M3	IP20	28	1.1	1	**VW3A7742**	4.000/ *8.818*
ATV930U55M3	IP20	16	2.2	1	**VW3A7743**	7.000/ *15.432*
ATV930D11M3	IP20	10	3.4	1	**VW3A7744**	11.500/ *25.353*
ATV930D18M3	IP23	5	6.9	1	**VW3A7746**	27.000/ *59.524*
ATV930U07N4...U40N4 ATV950U07N4...U40N4 ATV950U07N4E...U40N4E	IP20	100	1.7	1	**VW3A7750**	5.500/ *12.125*
ATV930U55N4…U75N4 ATV950U55N4…U75N4 ATV950U55N4E…U75N4E	IP20	60	3.4	1	**VW3A7751**	10.000/ *22.046*
ATV930U40M3 ATV930D11N4...D15N4 ATV950D11N4...D15N4 ATV950D11N4E...D15N4E	IP23	28	5.1	1	**VW3A7752**	25.000/ *55.116*
ATV930U75M3 ATV930D18N4…D30N4 ATV950D18N4…D30N4 ATV950D18N4E…D30N4E	IP23	16	14	1	**VW3A7753**	47.000/ *103.617*
ATV930D37N4...D45N4 ATV950D37N4...D45N4 ATV950D37N4E...D45N4E	IP23	10	19	1	**VW3A7754**	67.000/ *147.710*
ATV930D90N4 ATV950D90N4 ATV950D90N4E	IP23	10	19	2		
ATV930D15M3 ATV930D55N4 ATV950D55N4 ATV950D55N4E	IP23	8	25	1	**VW3A7755**	86.000/ *189.597*
ATV930D22M3 ATV930D75N4 ATV950D75N4 ATV950D75N4E	IP23	5	32	1	**VW3A7756**	126.000/ *277.782*
ATV930D30M3…D45M3 ATV930C11N4C...C16N4C	IP23	5	32	2		
ATV930C22N4 ATV930C25N4C	IP23	5	32	3		
ATV930C31N4C	IP23	5	32	4		
ATV930D55M3C...D75M3C	IP23	1.4	29	1	**VW3A7757**	114.000/ *251.327*

(1) Load factor for resistors: The value of the average power that can be dissipated at 50 °C/122 °C from the resistor into the casing is determined for a load factor during braking that corresponds to the majority of normal applications:
- Heavy duty: 54 s braking with a 1 Tn braking torque and 6 s braking with a 1.65 Tn braking torque for a 120 s cycle