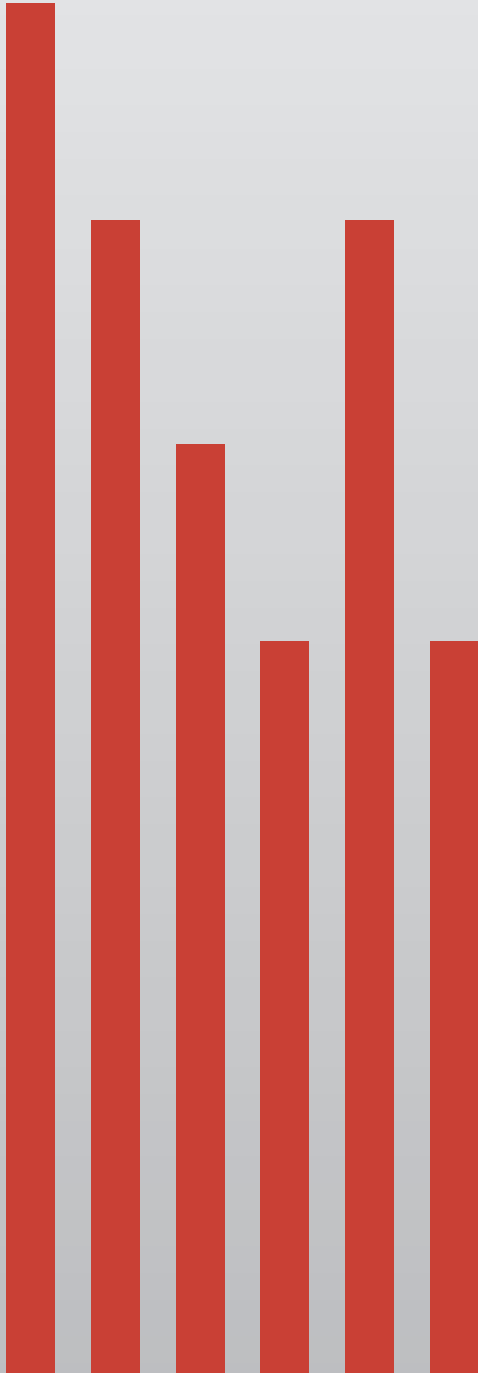




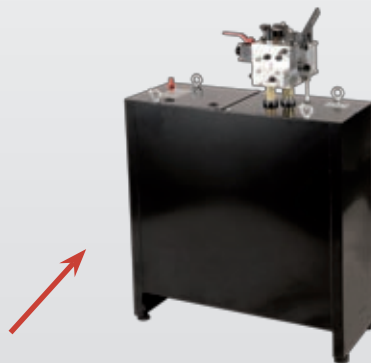
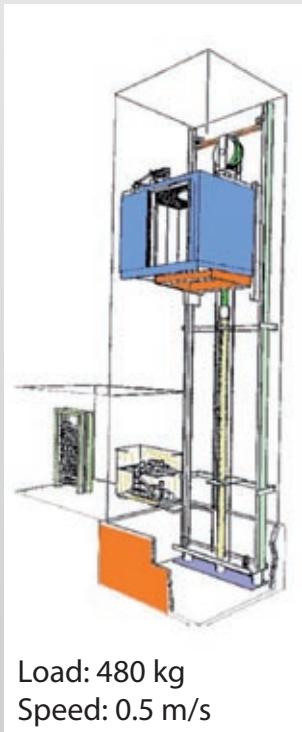
ESC - ENERGY SAVING CONCEPT



What is it the ESC ?

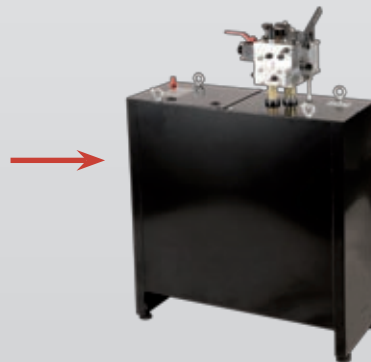
The **ESC** is a new motion system for hydraulic elevator studied for the inverter technology. It has been developed to increase the efficiency of the elevator system in terms of energy consumption and power required to motion, while retaining the know advantages of hydraulic traction simplicity.

IF YOU REALLY CARE ENVIROMENT ESC IS FOR YOU !



Standard power unit

Pump: 115 L/min
Motor: 7.7kW
Mains size: 20kW



+

INVERTER

Standard power unit with Inverter

Pump: 115 L/min
Motor: 7.7kW
Mains size: 10kW



ESC

Pump: 115 L/min
Motor: 6kW
Mains size: 10kW



What are the advantages I can have using an inverter to control the car motion in up direction?

With an inverter you can comfortably regulate the motor speed, so the oil flow is not wasted to the tank during the deceleration and slow speed phase. Furthermore the elevator will more precisely approach the floor stop. In that way there is an reduction of energy consumption about 20-30% respectively for long and short car travel. This energy saving also turns into an important reduction of oil overheating,. More over with an inverter you don't have reactive power ($\cos(\varphi) > 0.96$) and starting current peak, so you can save about the size of current meter. Finally, for further energy reduction, with the Inverter drive you can also limit the maximum drained power from the mains line; this can be easily obtained by slightly reducing nominal upward car speed.

MOTOR DATASHEET				STANDARD DIRECT STASTING	WITH SOFT STARTER	WITH INVERTER		
NOMINAL MOTOR OUTPUT [kW]	POWER FACTOR $\cos\varphi$	NOMINAL CURRENT [A]	STARTING CURRENT [A] [kW]	MAINS SIZE REQUIRED (1) [kW]	MAINS SIZE REQUIRED (2) [kW]	NOMINAL CURRENT / STARTING CURRENT [A]	MAINS SIZE REQUIRED (2) (WITHOUT LIM.) [kW]	MAINS SIZE REQUIRED (2) (WITH LIM.) [kW]
6,00	0,77	14,5	47	15	10	12	10	6
7,70	0,84	17,5	54	20	15	15,5	10	6
8,50	0,82	20	64	20	15	17	15	10
9,50	0,85	21,8	76	25	15	19,5	15	10
12,00	0,86	26,5	88	30	20	24	15	10
16,00	0,86	34	122	40	25	30,5	20	15
20,00	0,89	42	153	50	30	39	35	20

Required power: standard power unit vs VVVF power unit (Italian ENEL)

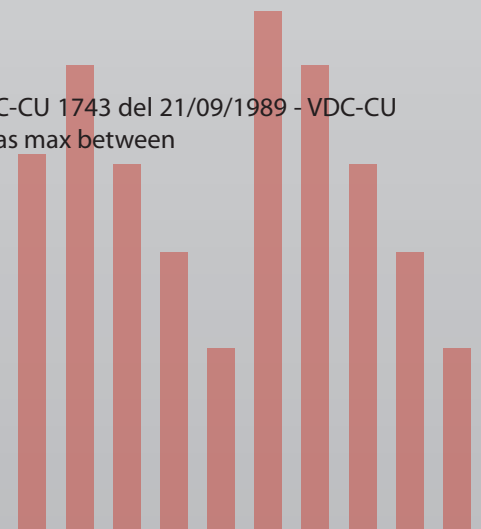
-Current values in the table are for 400V 50Hz

-Power required, (as written in CIP 36/79 - Letter DDC 1927 del 15/07/1982 - VDC-CU 1743 del 21/09/1989 - VDC-CU 1473 del 26/04/1994 and updating of 30/12/1998 SEZ. LL 04.02.00) is calculated as max between

(1) $P = 1.73 \cdot 400 \cdot I_{start} / 2 \cdot 0.9$ and

(2) $P = 1.73 \cdot 400 \cdot I_n \cdot 0.9$

and then rounded to the next commercially available Mains size



What is the difference between the ESC and an application with inverter drive upon a standard power unit?

ESC increases the efficiency of hydraulic system. New control valve and motor designs reduce the power unit's hydraulic losses up to 60 %, thus it reduces the motor power required to the motion of 1.5-2 kW, and the oil stays cooler!

