ELECTRIC CHAIN HOIST

DMK SERIES

DMK series, the most reliable and safe way to lift loads up to 4.000 kg.

The DMK electric hoists with self-braking conical motors, have always been synonymous with quality and reliability.
Designed to meet the needs of the international market, they offer a wide range of uses, long-term reliability, safety guarantees during all operating phases and excellent value for money.

DMK hoists are also known for the quality of their components, the high technology used to machine mechanical parts, finishing and surface treatments.
The special water-repellent paintwork, applied with a completely enclosed electrostatic process, guarantees durability and constant top performance, including in particularly hostile environments.

MAX

4.000 KG

Quality and reliability
at your service

TROLLEYS

The electric chain hoist is generally used to lift un-guided loads, using a hook or handling accessories adequate for the purpose. When the hoist is combined with an electric or manual trolley, which runs on a beam, it ensures combined lifting and horizontal movement of the load.

The electric chain hoist and trolleys can be mounted overhead and fitted with monorails or be incorporated and become the completion of other lifting machines such jib cranes, bridge cranes. The electric chain hoist, positioned overhead or on the ground, can also be used in various fixed position configurations.

POWERFUL AND SAFE TROLLEYS AT YOUR SERVICE

DMK series electric chain hoists and electric trolleys are manufactured based on a modular component design, assembled together based on commercial needs, and make it possible to quickly and inexpensively create many standardised and special executions; in addition to the standard versions always available in the warehouse.
Thanks to the extreme compactness of the basic components, i.e. the motor and gearbox, they are assembled together in a coaxial line, in order to ensure the maximum use of the hook run and minimum encumbrance of the hoist.
The construction of all components is based on production processes that make it possible to create completely reliable and technically high-performing machines through economies of scale.
The high quality level is guaranteed and controlled by the company quality system certified according to the standard EN ISO9001: 2008

THE ELECTRIC CHAIN HOIST RANGE

The DMK Range – Series, Capacities and Lifting Speed.

4 BASIC SIZES
DMK 1-2-3-4, for loads from 100 to 4,000 kg, in FEM (ISO) service units 1Bm (M3) - 1Am (M4) - 2m (M5).

ONE LIFTING SPEED
Created with 1 polarity motor:
- 4, 6.3, 8 or 16 m/min 1 fall for 1 chain fall hoists
- 3.2 or 4 m/min 2 fall for 2 chain fall hoists

TWO LIFTING SPEEDS
Created with pole changing motor:
- 4/1.2, 6.3/2.1 or 8/2.5 m/min for 1 chain fall hoists
- 2.5/0.8 or 3.2/1 m/min. for 2 chain fall hoists

STANDARD HOOK PATH: up to 12 m
- over 12 m upon request

PROTECTION AND INSULATION OF ELECTRICAL PARTS
Self-braking In the lifting and travelling motors;
- IP55 protection – “F” insulation class
- DMK 1-2-3-4 brake: IP23
- Limit switch: IP65 minimum protection – 500 V maximum insulation voltage
- Cables: IEC 20/22 II 450/750 V maximum insulation voltage
- Non-standard protections and insulations are available upon request.

ELECTRICAL POWER SUPPLY
- Standard DMK electric chain hoists are designed to be powered with AC current with the following voltage:
  - three phase of 400 V - 50Hz. according to IEC 38-1
  - single phase of 230 V +/- 5% - 50 Hz. (for DMK 1-2-3 hoists at one speed and capacity up to 800 kg)
- Non-standard voltages and frequencies are available upon request.

NOMINAL USE CONDITIONS IN THE STANDARD EXECUTION:
- Operating temperature: minimum -10°C; maximum +40°C
- Maximum relative humidity: 80%
- Maximum altitude 1000 m above sea level
- The machine must be installed indoors, in a well-ventilated place, free from corrosive fumes (acid fumes, saline mist, etc.)

NOISE LEVEL
- The sound pressure level emitted by the hoist when fully loaded is always less than 85 dB (A). The incidence of environmental characteristics such as the transmission of sound through metallic structures, reflection caused by combined machines and walls, is not included in the indicated level.

FIXED EXECUTION:

eyebolt suspension or hook suspension (upon request).

TROLLEY EXECUTION HAND-PUSHED:

horizontal movement by manually pushing the load.
ELECTRIC: movement is motorised (one or two speeds) and controlled directly from the hoist push button pendant.
CHAIN: horizontal movement by chain controlled by the operator who controls the trolley wheels.

LOW HEADROOM EXECUTION:

to use the maximum hook run, the hoist is fitted with a chain return system mounted on the trolley (electric or hand-push) with compact dimensions.

“CLIMBING” EXECUTION:

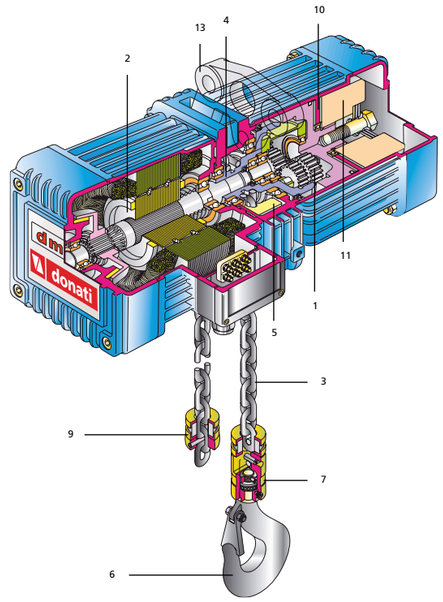
the climbing execution makes it possible to reach the installation point with just the hook and chain, without having to lift the entire weight of the hoist. It is particularly suitable for machinery installations industry, or when frequent hoist assembly/disassembly operations are required at a greater height.

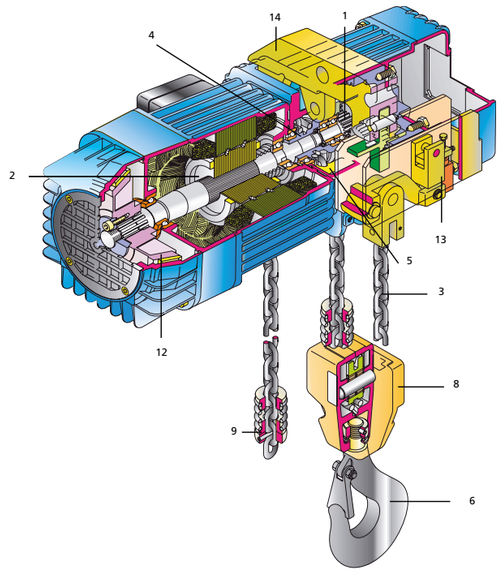
THE ELECTRIC CHAIN HOIST RANGE

FIXED EXECUTION,
ELECTRIC AND HAND-PUSHED
TROLLEY EXECUTION,
LOW HEADROOM EXECUTION AND
“CLIMBING” EXECUTION

THE HOIST IN DETAIL

DESIGN AND CONSTRUCTION





1 CHAIN FALL UP TO 2000 kg

This is a winning technical solution that offers:

- more compact design and greater hook run since the bottom block has smaller dimensions compared to a hook block and the chain box is smaller;
- greater safety for the operator who can touch the hook and chain without the risk of being dragged in and crushed;
- greater reliability, less maintenance and lower operating costs since jamming cannot occur, the chain is not worn by the return and there are no moving parts to replace in the bottom block;
- greater use flexibility.

2 CHAIN FALLS OVER 2000 kg

This solution is aimed at the affordability of the entire system which: offers a fixed anchoring point on which to apply a sensitive load limiter that is suitable for heavy-duty applications and does not require useless overdimensioning of the weight-bearing structure; keeping the dimensions and the cost of the chain contained.

1. GEARBOX

Epicyclic reduction gear with thermally treated, high resistance steel wheels, supported on ball bearings and lubricated in oil bath. The frame is a radiating fin structure in aluminium alloy to improve heat dissipation.

2. SELF-BRAKING ELECTRIC MOTOR

The axial movement of the conical brake allows fast, reliable mechanical braking over time [RES. 4.1.2.6. c - Annex I Machinery Directive]. The brake lining is asbestos free. Asynchronous three phase with single polarity for one speed hoists, with pole changing version for two speed hoists.

3. CHAIN

The chain is gauged and made of high-strength steel rod with excellent dynamic stability, ultimate tensile strength of 80 kg/mm2 and ultimate elongation no higher than 10%. The applicable safety coefficient is always greater than 5 [RES. 4.1.2.4. – Annex I Machinery Directive]. The heat and galvanising treatments applied to the chain provide high resistance to wear, aging and corrosion.

4. LOAD SPROCKET

The load sprocket is heat treated and has five pockets mechanically machined on high precision automatic machinery. The sprocket drives the chain, ensuring perfect chain movement.

5. CHAIN GUIDE (INSERTER/EXTRACTOR)

The chain guide is used to insert and extract the chain links both in and out of the pockets, both when lifting and lowering [RES. 4.1.2.4. Annex I Machinery Directive].

6. LOAD HOOK

The hook is made from high strength steel and is equipped with a safety device (spring catch) to prevent the load from unhooking [RES. 4.1.2.6. e - Annex 1 Machinery Directive] and rotates on a thrust bearing.

7. BOTTOM BLOCK (ONE CHAIN FALL HOISTS)

This connects the chain to the turning hook. It is made of steel and is equipped with a heat-treated large cross-section pin to lock the chain.

8. HOOK BLOCK (2 CHAIN FALL HOISTS)

Made of cast aluminium, completely closed, it is fitted with a high resistance steel transmission reel that is thermally treated and has pockets for housing the chain.

9. CHAIN STOPS

The stops are installed on the free descending and ascending sections of the chain on one fall hoists. They act as limit switches for hoist travel [RES. 4.1.2.6.a - Annex I Machinery Directive]; they are made of forged steel and are fitted with a shock-absorbing insert.

CHAIN BOX

The chain box is used to hold the descending section of the chain. It is available in different sizes based on the hook travel. It is made of shock-resistant plastic and is equipped with suspensions to allow free movement.

10. CLUTCH DEVICE (ONE CHAIN FALL HOISTS)

This is an emergency device, an up and down limit switch. It also acts as an overload protection [RES. 4.2.1.4. Annex I Machinery Directive]. The clutch discs are asbestos free and are preloaded with a Belleville washer system.

11. BALANCER (ONE CHAIN FALL HOISTS)

The balancer is connected to the clutch device and ensures hoist balancing. It absorbs the heat generated during clutch movement.

12. DMK 2-3-4 BRAKE

The brake shoe installed on sizes 2-3 and 4 is made with a fan which ensures cooling of the brake and the motor. The high degree of inclination of the braking surface allows perfect unlocking of the brake even in the most difficult working conditions.
Brake adjustment is easily performed since it can be done from the outside using the adjusting ring.

13. OVERLOAD DEVICE (TWO CHAIN FALL HOISTS)

Electromechanical with a microswitch for one intervention threshold [RES. 4.2.1.4 - Annex I Machinery Directive]. The overload device does not allow the hoist to be loaded with an overload exceeding 20% of its maximum capacity, by blocking the lifting control circuit.

LIFTING LIMIT SWITCHES

Standard equipment for 2 chain fall hoists and available upon request for 1 chain fall hoists. They limit the hook's ascent and descent runs [RES. 4.1.2.6 a) - Annex I Machinery Directive]. They are composed of two precision microswitches which function according to the "slow positive opening" principle and work on the auxiliary circuit of the lifting motor control device.

14. SUSPENSION

It is produced with an eyebolt fitting; it can be made with a hook execution upon request or even a 90° eyebolt version for longitudinal hoist.

ELECTRICAL CONTROLS

When the hoist is supplied with electrical control, the movements can be activated, alternatively, by:

- **low voltage controls at AC 48V - 50Hz**, including: the transformer for the low voltage power supply of the control circuits, the general line contactor, the contactors for the control of the hoist and electric trolley motors, transformer protection fuses and terminal block for connections of the auxiliary and power circuits. The components are contained in a sealed box with IP 55 protection, made of shockproof thermoplastic material. The equipment is installed on the motor side of the hoist.
- **direct control**, direct control with mains voltage, solely available for the control of the electric hoist, for raise and lower functions. It is composed by a pushbutton panel that interrupts and directly switches the power line.

In both options, the controls are activated by the hanging pushbutton panel, with ergonomic shape, made of self-extinguishing, shockproof, waterproof, thermoplastic material, with IP 65 protection. The emergency stop function [RES. 1.2.4 - Annex I Machinery Directive], is produced with a mushroom-head button which, using an intentional release action, puts the control circuit in forward position [RES. 1.2.3 Annex I Machinery Directive].
The hanging push button pendant is connected to the hoist by a multipolar electrical cable supported by tear proof metallic parts.

DMT TROLLEYS

used to horizontally move the load. They are manufactured in three difference versions: **SM** type, hand-pushed; **CM** type, mechanically-operated chain and **EM** type, electrically-operated. They move on the lower flange of the beam and can be adjusted based on the flange width.
They are made of pressed steel plate (GR 2) and in pantographed sheet (GR3, 4 and 5) have anti-derail brackets [RES. 4.1.2.2. Annex I Machinery Directive] and shock-absorbing buffers.
The trolleys are equipped with forged steel machined wheels rotating on permanently lubricated ball bearings.
Gear motor with self-braking motor: provides motion to the trolley toothed wheels in the electric version, EM type [RES. 4.1.2.6. c - Annex I Machinery Directive].
Limit switch: these switches limit horizontal travel of the electric trolley on the beam [RES. 4.1.2.6. a – Annex I Machinery Directive].
Towing arm: the towing arm, which connects the trolley to the power supply, is available for all types of trolleys of the DMT series. It can be easily adjusted in all directions and is an essential part for towing the power cable without tearing the conductors.

STANDARDS AND CERTIFICATIONS

DESIGN AND CONSTRUCTION

DMK electric chain hoists and their trolleys are designed and manufactured according to the **"Essential Safety Requirements" of Annex I of Machinery Directive 2006/42/EC** and are placed on the market **equipped with the CE mark** and **CE Declaration of Conformity - Annex II A.**

In addition DMK electric chain hoists and their trolleys are in compliance with the following directives:

- LOW VOLTAGE DIRECTIVE 2014/35/UE
- ELECTROMAGNETIC COMPATIBILITY DIRECTIVE 2014/30/UE

DMK series electric chain hoists and their trolleys are also available with CSA homologation, upon request.

REFERENCE NORMATIVE FRAMEWORK

The design and construction of DMK series electric chain hoists and their trolleys comply with the following technical standards and rules:

- EN ISO 1210:2010 "Fundamental concepts, general design principles"
- EN ISO 13849-1:2008 "Safety-related parts of control systems (where required)"
- EN 12077-2:2008 "Limiting and indicating devices"
- EN 60204-32:2009 "Safety of the electrical equipment of lifting machines"
- EN 60529:1997 "IP enclosure (IP Codes)"
- ISO 4301-1:1988 "Classification of lifting equipment"
- DIN 15401 "Choice of lifting hooks"
- FEM 1.001/98 "Rules for the design of lifting equipment"
- FEM 9.511/86 "Mechanisms classification"
- FEM 9.671/88 "Quality of chains"
- FEM 9.683/95 "Choice of lifting and traverse motors"
- FEM 9.755/93 "Periods of safe work"
- FEM 9.941/95 "Control symbols"

CRITERIA OF USE AND OPERATING LIMITS

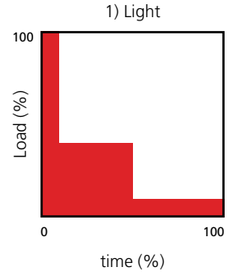
It is necessary to check the parameters which characterise the operating limits of the DMK electric chain hoists to be able to have a complete correspondence between the DMK electric chain hoists and the service they were designed for. These are the actual lifting capacities, which must always be less than or equal with respect to the nominal capacity of the hoist state of stress and average duration of daily operation.

ACTUAL LIFTING CAPACITY
This is determined by the heaviest load to be lifted.

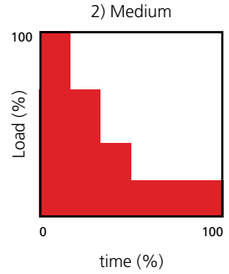
The nominal lifting capacity of the hoist must be ≥ the actual lifting capacity.
Lifting capacity = kg

THE STATE OF STRESS

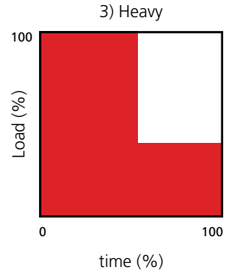
The state of stress is evaluated considering the actual entity of the loads to be lifted and it is ascribable to one of four spectrums of load shown below which determine the type of service.



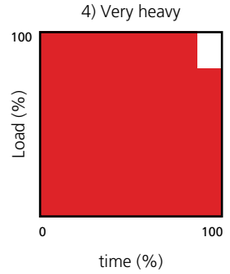
Hoists which rarely lift maximum loads but mainly reduced loads



Hoists which lift approximately the same number of maximum, medium and reduced loads.



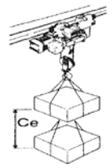
Hoists which frequently lift the maximum load but normally medium loads.



Hoists which regularly lift loads approximately equal to the maximum load.

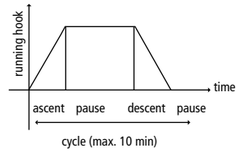
AVERAGE DURATION OF DAILY OPERATION

For LIFTING operations the average duration of operation is calculated as follows: **Tm** (hours) **= (Ce x C/h x Ti) / (30 x V)**



Actual hook run
Ce = m

It is the average of the actual runs of the load

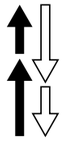


Cycles in an hour
C/h = N°

It is the number of complete ascents and descents carried out in an hour.

Running time
Ti = hours

Hoist running time in a whole day.



Lifting speed
V = m/min

It is the distance covered by the load in a minute.

OPERATING LIMITS OF DMK HOISTS IN RELATION TO THE SERVICE GROUPS OF THE MECHANISMS, ACCORDING TO FEM 9.511/86 (ISO 4301-1:1988)							
GROUP FEM (ISO)	AVERAGE DURATION OF DAILY OPERATION - TM = HOURS; WITH LOAD				INTERMITTENCE RATIO %	N° OF STARTS PER HOUR	N° OF CYCLES PER HOUR
	1) LIGHT	2) MEDIUM	3) HEAVY	4) VERY HEAVY			
1Bm(M3)	2	1	0,5	0,25	RI = 25%	A/h = 150	C/h = 25
1Am(M4)	4	2	1	0,5	RI = 30%	A/h = 180	C/h = 30
2m(M5)	8	4	2	1	RI = 40%	A/h = 240	C/h = 40