Electric wire rope hoists "VF" SERIES

For capacity from 1.000 to 50.000 kg

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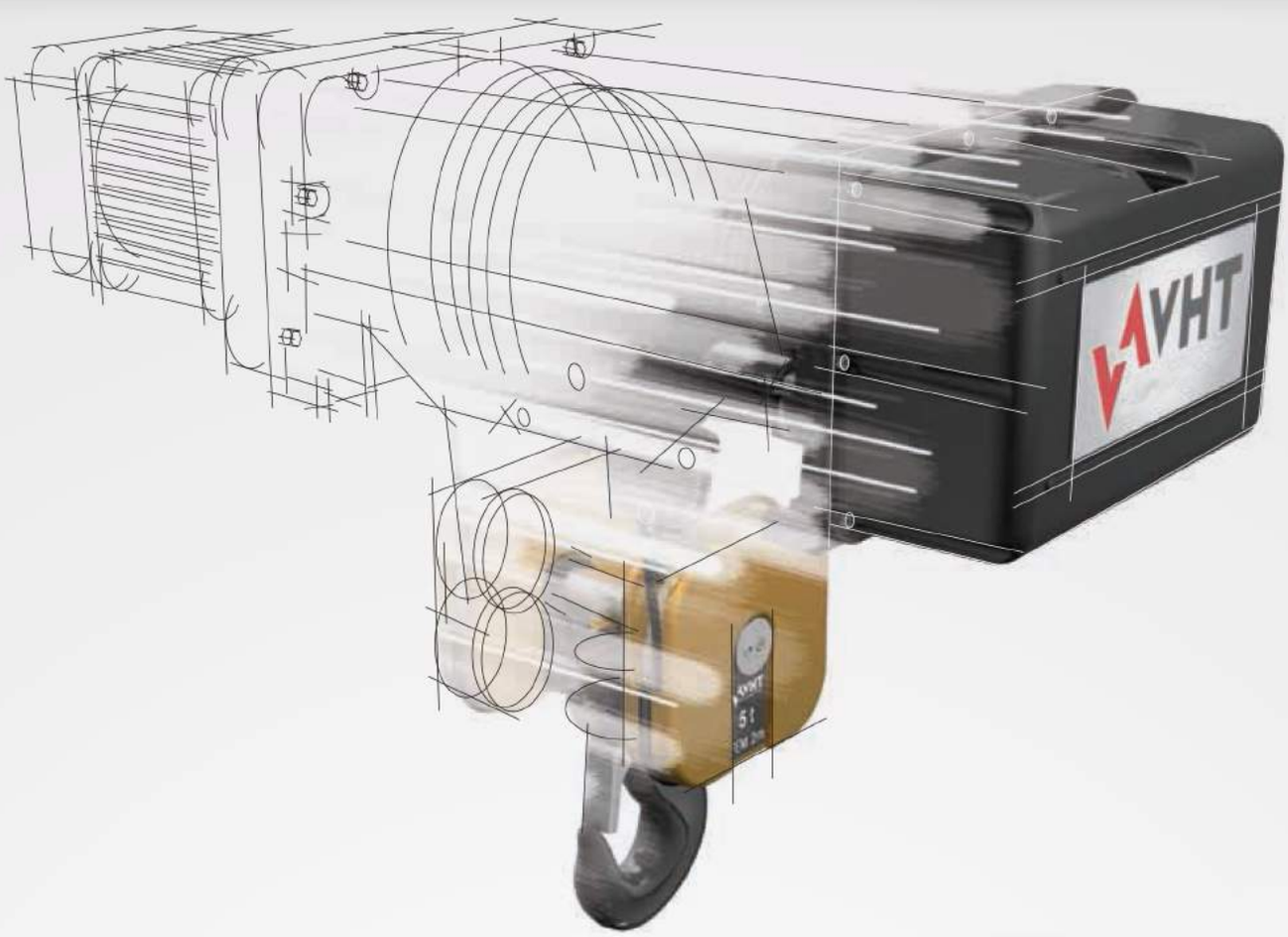

VHT

www.vhtitaly.com


VHT
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“Innovation by tradition”

VHT www.vhtitaly.com *offers the most modern technical-technological compendium in the global market, both reliable and economical, thanks to the long experience of our engineers of technical design and production of hoisting equipment.*
*The electric wire rope hoists **“VF” series**, for capacity from 1.000 to 50.000 kg are designed and manufactured using cutting-edge design techniques such as 3D CAD system integrated with finite element calculations.*
*The electric wire rope hoists **“VF” series** overcome rigorous life and reliability testing in our modern “Experience Department”, in order to assure compliance to the standard rules and project data, within the highest quality standards*

A RIGOROUS PROCESS CONTROL

VHT www.vhtitaly.com *produces electric wire rope hoists “VF” in a highly serialized way, with the benefits of industrialized production processes controlled by **a quality system conducted** in compliance with **UNI EN ISO 9001:2015***

THE ELECTRIC HOISTS “VF” SERIES AND THEIR TROLLEYS “VT” SERIES

***The electric wire rope hoists “VF” series**, for capacity from 1.000 to 50.000 kg, are generally used to hoist an unguided load by means of a hook or other handling accessories.*
***The electric trolleys “VT” series**, single or double girder, suitable to run on a beam at high altitude, ensures the integrated handling of lifting and horizontal movements of the load when combined with a hoist.*
***The electric wire rope hoists “VF” series** with related trolleys “VT” series can be singularly positioned on monorails or can constitute the lifting unit of other machines in which they have been incorporated such as jib cranes, bridges crane, etc.*

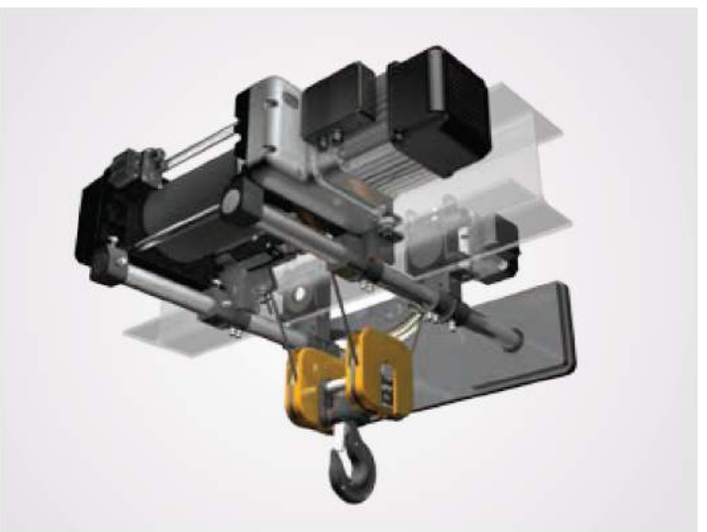
ELECTRIC WIRE ROPE HOISTS “VF” WITH 2,4 AND 8 ROPE FALLS = SAFETY AND RELIABILITY

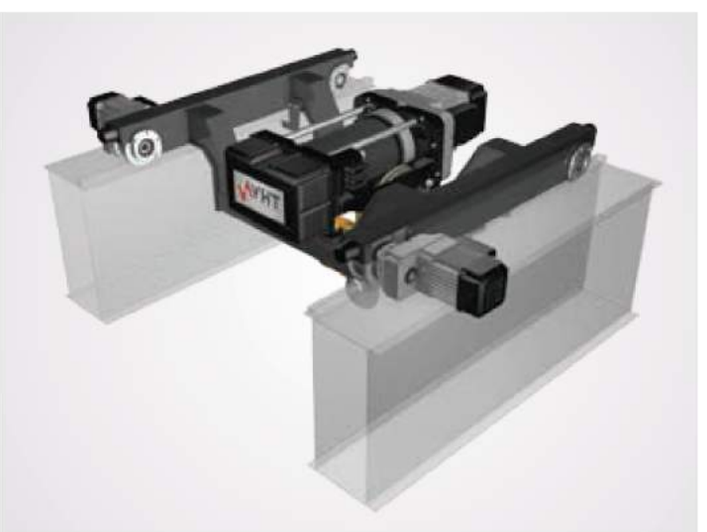
***All the electric hoists “VF” series, for capacity from 1.000 to 50.000 kg** are characterized by a modern and compact design ensuring maximum use of hook’s work and are characterized by the following standard-features:*

- *High ratio between the drum diameter and the rope diameter, that is always more than 20, that is more than what is provided by the service group ISO M6 (FEM 3m);*
- *Use of extra flexible ropes, characterized by high efforts resistance while increases therefore its life, implying an important reduction of maintenance costs and highest functional reliability*
- *Left hand-lay threading of the drum, suitable for right hand-lay ropes more easily available on the market;*
- *Drive-tighten-rope Ring, in spheroidal cast iron, allowing to absorb without damage oblique pulls and ensuring the safe positioning of the rope within the drum’s grooves preventing the exit from the pulley.*

*These solutions provide **maximum safety for the operator** as well as the **maximum life of the rope**, with the **highest functional reliability** and high reduction of the maintenance costs.*
Safety and Reliability = 3 years warranty from the delivery date.

The range of the electric wire rope hoists “VF” series



The range of the electric wire rope hoists "VF" series is produced in 4 sizes:

"VF1" - "VF2" - "VF3" - "VF4"

- *For capacity from 1.000 to 50.000 kg;*
- *In the Service Group:*
  - *FEM 1am (ISO M4);*
  - *FEM 2m (ISO M5);*
  - *FEM 3m (ISO M6).*
- *At one and two hoisting speeds;*
- *For standard hoisting heights up to 48 m.*

Standard execution:

Hoist in fixed execution with support bases;
Hoist with single girder trolley in short headroom execution;
Hoist with double girder electric trolley in normal execution and short headroom

Regulatory compliance

LEGISLATIVE FRAME

The electric wire rope hoists "VF" series and related trolleys "VT" series are compliant to the ***Essential Requirements of Safety in attachment I*** *of the* ***Community Directive 2006/42/CE*** *and are, therefore, provided with* ***EC Declaration of Conformity of Annex IIA*** *and* ***CE marking in Annex III*** *of the Directive.*

In addition, electric wire rope hoists "VF" and related trolleys "VT" comply with the ***Low Voltage Directive 2014/35/UE*** *and the* ***EMC Directive 2014/30/UE***

REGULATORY FRAME

In the design and assembling of the electric wire rope hoists "VF" series and related trolleys "VT" series, were taken into consideration the following main technical standards and regulations:

EN ISO 12100:2010 *"Essentials principles for design concepts"*
EN ISO 13849-1:2008 *"Parts of control systems related to safety"*
EN 12385-4:2008 *" Steel ropes-Safety-Part 4: Ropes for general use in lifting equipment"*
EN 13135-1:2010 *"Lifting equipment - Part 1 – Electro technical equipment"*
EN 13135-2:2010 *"Lifting equipment - Part 2 – Equipment not electro-technical"*
EN 12077-2:2008 *"Limiting and indicating devices"*
EN 13001-1:2009 *"Lifting equipment – General criteria for design - Part 1 – General principles and Requirements"*
EN 13001-2:2011 *"Lifting equipment – General criteria for design - Part 2 – Loads actions"*
EN 13001-3-1:2012 *"Lifting equipment – General criteria for design - Part 3-1 – Stress limit"*
EN 14492-2:2009 *"Lifting equipment - Part 2: Electric hoists"*
EN 60204-32:2008 *"Safety of the electric equipment of lifting machines"*
EN 60529:1997 *"IP enclosures"*
ISO 4301-1:1988 *"Classification of lifting equipment."*
DIN 15400 *"Choice of the lifting hooks – Mechanical properties and capacities"*
DIN 15401 *"Choice of the lifting point hooks"*
FEM 1.001/98 *"Calculation of the lifting equipment"*
FEM 9.511/86 *"Classification of the mechanisms"*
FEM 9.661/86 *" Choice of drums, ropes and sheaves"*
FEM 9.683/95 *"Choice of lifting and traverse motors"*
FEM 9.755/93 *"Periods of safe work"*
FEM 9.761/93 *"Overload devices"*
FEM 9.941/95 *"Controls symbols"*

ENCLOSURE AND INSULATION OF ELECTRICAL COMPONENTS:

- *Lifting and travelling motors: IP55 protection – Class "F" insulation*
- *Limit switches: IP65 minimum protection – Maximum insulation voltage 500 V*
- *Cables: CEI 20/22 II – Maximum insulation voltage 450/750 V*
- *Protections and insulations different from standard are available on request.*

ELECTRIC POWER SUPPLY:

- *The electric wire rope hoists "VF" series and related trolleys "VT" series are suitable, in their standard equipment, to be supplied with alternate electric current with three-phase voltage of 400 V +/- 10%.*
- *Voltage and frequency different from standard, or execution with one-phase alternate current, are available on request.*

WORKING AMBIENT CONDITIONS IN STANDARD EXECUTION:

- *Working temperature: minimum - 10° C; maximum + 40°C*
- *Maximum relative humidity: 90%*
- *Maximum altitude 2.000 m above sea level*
- *The hoist must be installed indoor, in a well-ventilated environment, free of corrosive vapors (acid vapors, saline mist, etc.).*
- *Special executions, for different environments or outdoor installations, are available on request.*

NOISE – VIBRATIONS:

- *The noise level emitted by electric wire rope hoists "VF" series and related trolleys "VT" series, in a fully loading condition, is always less than 75 dB (A), measured at 1 m of distance and at 1,6 m from the ground.*
- *The vibrations produced by the hoist are not dangerous for the health of the workers.*

Classification of the service group of the electric wire rope hoists “vf” series:

*The electric wire rope hoists “VF” series are designed and classified according to standard **EN 13001-1**, in order to operate according to the parameters relating to the service group corresponding to **FEM 1Am, 2m and 3m** (FEM 9.511/86) or **ISO M4, M5 and M6** (ISO 4301-1:1988).*
The duty cycle of the motor is superior compared to the minimum requirements provided by rule FEM 9.683/95.

Cm = Average run of the hook (m) with intermittent use of the hoist																								
Hoist speed		Single speed hoist with single polarity motor (motor 4 poles)						Two speeds hoist with double polarity motor at 4/12 poles or 4/16 poles																
								main speed (fast polarity 4 poles)						Auxiliary speed										
														Slow polarity 12 poles (= 1/3 of the main speed)						Slow polarity 16 poles (= 1/4 of the main speed)					
Ratio of intermittence (RI %)		60%						40%						20%						20%					
Avviamenti ora (C/h = N°)		360 [with 6 starting x cycle]						120 [with 6 starting x cycle]						240 [with 6 starting x cycle]						240 [with 6 starting x cycle]					
Start-up per hour (C/h = N°)		10	20	30	40	50	60	10	20	30	40	50	60	10	20	30	40	50	60	10	20	30	40	50	60
Average hook run (m) With main speed of	2 m/min	3,6	1,8	1,2	0,9	0,7	0,6	2,4	1,2	0,8	0.6	0,4	0,4	0,3	0,1	0,1	=	=	=	0,2	0,1	0,1	=	=	=
	2,5m/min	4,5	2,2	1,5	1,1	0,9	0,8	3,0	1,5	1,0	0,8	0,6	0,5	0,4	0,2	0,1	=	=	=	0,3	0,1	=	=	=	=
	3 m/min	5,4	2,7	1,8	1,4	1,0	0,9	3,6	1,8	1,2	0,9	0,7	0,6	0,5	0,2	0,2	0,1	=	=	0,3	0,2	0,2	=	=	=
	4 m/min	7,2	3,6	2,4	1,8	1,4	1,2	4,8	2,4	1,6	1,2	0,9	0,8	0,6	0,3	0,2	0,1	0,1	=	0,5	0,2	0,2	0,1	0,1	=
	5 m/min	9,0	4,5	3,0	2,3	1,8	1,5	6,0	3,0	2,0	1,5	1,1	1,0	0,8	0,4	0,3	0,1	0,1	0,1	0,6	0,3	0,2	0,1	0,1	0,1
	6 m/min	11	5,4	3,6	2,7	2,1	1,8	7,2	3,6	2,4	1,8	1,4	1,2	0,9	0,5	0,3	0,2	0,2	0,2	0,7	0,3	0,2	0,1	0,1	0,1
	8 m/min	14	7,2	4,8	3,6	2,8	2,4	9,6	4,8	3,2	2,4	1,8	1,6	1,2	0,6	0,4	0,2	0,2	0,2	0,9	0,5	0,3	0,1	0,1	0,1
	10m/min	18	9,0	6,0	4,5	3,5	3,0	12	6,0	4,0	3,0	2,3	2,0	1,5	0,8	0,5	0,3	0,3	0,3	1,1	0,6	0,4	0,2	0,2	0,2
	12m/min	22	11	7,2	5,4	4,2	3,6	14	7,2	4,8	3,6	2,7	2,4	1,8	0,9	0,6	0,3	0,3	0,3	1,4	0,7	0,5	0,2	0,2	0,2

Criteria of choice for the electric wire rope “VF” series
In order to choose the right hoist for the required service it’s important consider the following factors:

1. ***The capacity of the hoist:** is determined by the maximum load to lift*
2. ***The loading rate (Q):** is the stress level due to the percentage of use of the capacity (average of the loads to be lifted)*
3. ***The average daily running time - Tm** (hours) and **the maximum number of working cycles C_A**, calculated with the following formulas:*

$$Tm\ (hour) = \frac{2 \times Cm \times C/h \times Ti}{60 \times V} \qquad C_A = C/h \times Ti \times G/year \times A$$

where: ***Cm** = Corsa gancio effettiva (m) - E’ la media delle effettive corse del carico*
***C/h** = Operating cycles (N° cycles per hour) – It’s the number of complete up/down operations per hour*
***Ti** = Hoist running time (hours) – It’s the hoist running time in the whole day*
***V** = Lifting speed (m/min) – It’s the distance covered by the load in a minute*
***A** = Years of service (N° years) – It’s the number of years, not less than 10 , for which the life of the machine is calculated*

In relation to the following use factors:

- *Loading rate (**Q**)*
- *Average daily running time (**Tm**)*

Is determined the service group FEM/ISO.

The type of electric wire rope hoist "VF" series is selected, in the table "CHARACTERISTICS AND TECHNICAL DATA", according to the capacity of the hoist, as well as other factors, determined or calculated, that characterize the intended use (Loading rate, Average daily running time and Service Group FEM/ISO)

Operating cycles and life of the mechanisms in relation to the Loading rate (Q), the Average daily running time (Tm) and the Service Group FEM/ISO

Loading rate (Q) according to EN 13001-1, correlating with service groups FEM (ISO)						Operating cycles of the hoist (n°)	Lifetime of the hoist (hours)	Average daily running time Tm (hours)
FEM 1Am (ISO M4)		FEM 2m (ISO M5)		FEM 3m (ISO M6)				
Q	% of the max. load (% use of the capacity)	Q	% of the max. load (% use of the capacity)	Q	% of the max. load (% use of the capacity)			
=	=	=	=	Q_0	> 25% ≤ 32%	> 4.000.000 ≤ 8.000.000	100.000	> 16
=	=	Q_0	> 25% ≤ 32%	Q_1	> 32% ≤ 40%	> 2.000.000 ≤ 4.000.000	50.000	> 16
Q_0	> 25% ≤ 32%	Q_1	> 32% ≤ 40%	Q_2	> 40% ≤ 50%	> 1.000.000 ≤ 2.000.000	25.000	> 8 ≤ 16
Q_1	> 32% ≤ 40%	Q_2	> 40% ≤ 50%	Q_3	> 50% ≤ 63%	> 500.000 ≤ 1.000.000	12.500	> 4 ≤ 8
Q_2	> 40% ≤ 50%	Q_3	> 50% ≤ 63%	Q_4	> 63% ≤ 80%	> 250.000 ≤ 500.000	6.300	> 2 ≤ 4
Q_3	> 50% ≤ 63%	Q_4	> 63% ≤ 80%	Q_5	>80% ≤ 100%	> 125.000 ≤ 250.000	3.200	> 1 ≤ 2
Q_4	> 63% ≤ 80%	Q_5	>80% ≤ 100%	=	=	> 63.000 ≤ 125.000	1.600	> 0.5 ≤ 1
Q_5	>80% ≤ 100%	=	=	=	=	> 32.000 ≤ 63.000	800	> 0.25 ≤ 0.5

Example:

- *Maximum load: 5000 kg* → *Capacity of the hoist "VF" = 5000 kg*
- *Average of the loads to be lift: 3000 kg* → *Loading rate = Q3*
- *Average of the used lifting height: 1,5 m* → *Real lifting height Cm = 1,5*
  (corresponding to class $D_{lin\,2}$ of the standard EN 13001-1)
- *Up/down lifting operations per hours* → *N° cycles per hours C/h = 20*
- *Use on a working shift* → *Ti (hours) = 8*
- *Lifting speed: 4/1,3 m/min* → *Main speed V = 4*
- *Working days per year: 250* → *D/year = 250*

Calculation of the average daily running time *(hours) of daily use:*

$$Tm = \frac{2 \times Cm \times C/h \times Ti}{60 \times V} = \frac{2 \times 1{,}5 \times 20 \times 8}{60 \times 4} = 2 \text{ hour}$$

Calculation of the number of operating cycles *(CA) carried out in 10 years:*

$$C_A = C/h \times Ti \times G/year \times 10 = 20 \times 8 \times 250 \times 10 = 400.000 \text{ cycles}$$

(class U5 - EN 13001-1)

On the basis of the determined and calculated factors, the service group is:
Q3 - U5 - Dlin 2 according to the standard EN 13001-1, corresponding to FEM 2m (ISO M5).
Therefore, the electric wire rope hoist "VF" series suitable for the use shall be: ***24ND-N***

Electric trolleys “VT” series in standard execution

Electric single girder trolley with electric wire rope hoist “vf”series
short headroom execution

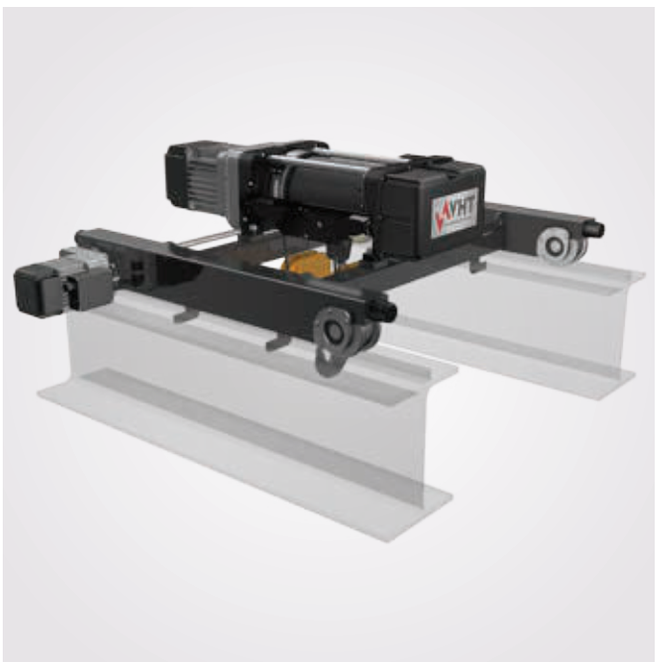
ELECTRIC TROLLEYS “VT” SERIES

*complete and equip the electric wire rope hoists series **"VF"**, allowing the horizontal movement of the load.*
They are available as standard in the following executions:

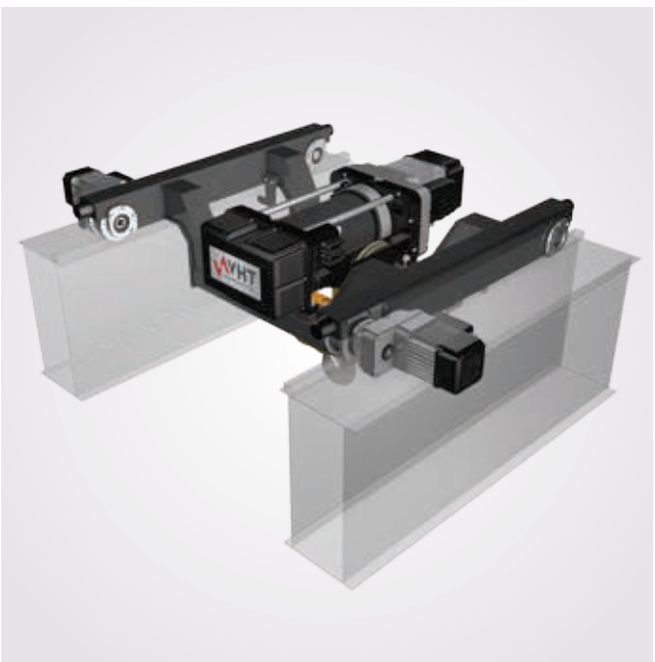
- ***short headroom electric single girder trolley***
- ***standard electric double girder trolley***
- ***short headroom electric double girder trolley***

SHORT HEADROOM ELECTRIC SINGLE GIRDER TROLLEY

Runs on the lower flange of a beam (monorail or single girder crane).
Among the different types of construction, the short headroom execution of the trolley allows the use of the maximum lifting height of the hoist.
The structure of the trolley is composed by four supporting plates, one drive and three idle, on which are supported the travelling wheels. The steel plates, obtained by laser cutting, pressed and bent, are shaped so as to obtain the anti-derailment and anti-drop devices.
According to the width of the beam, both the drive plate and the idle plates are sliding and adjustable, by means of brackets and locking dowels, along supporting bars steel circular cross-section calibrated. The bars also support, both the electric wire rope hoist series "VF," that is supported and fixed by suitable brackets, and the counterweight able to balance the eccentric mass of the hoist.
The wheels are made of machined pressed steel and rotating on ball bearings constantly lubricated. They haven’t flanges because the alignment of the trolley on the beam is ensured by steel roller guides, rotating on life lubricated bearings.
The drive wheel is powered by a asynchronous three-phase cylindrical rotor with electromagnetic brake, with progressive starting and braking at one or two speeds and single or double polarity.
The motor is coupled to a reduction gear, with gears with helical teeth with permanent lubrication in oil bath, within whose broached shaft is inserted the splined shaft integrated with the drive wheel itself.



Electric double girder trolley with electric wire rope hoist "vf"series
standard execution



Electric double girder trolley with electric wire rope hoist "vf"series
short headroom execution

As standard, the short headroom single girder trolleys are equipped with limit switches to delimit the transverse run, with emergency buffers consisting of four dumper buffers in rubber with high absorption of energy.

ELECTRIC DOUBLE GIRDER TROLLEY

Runs on the rails placed over two beams (double girder) and is available as standard with span of 1,000 mm or 1,200 mm, both in the standard and short headroom execution.
The trolley structure is composed by a frame made of welded steel tubes with square section, on which are supported the travelling wheels and the electric wire rope hoist "VF" series.
The trolley movement is ensured by four machined wheels in spheroidal cast iron (GJS 700), two-drive, with double flange rotating life lubricated.
The drive wheels are powered by a asynchronous three-phase cylindrical rotors with electromagnetic brake, with progressive starting and braking at one or two speeds and single or double polarity.
The motor is coupled to a reduction gear, with gears with helical teeth with permanent lubrication in oil bath, on which is connected a transmission bar integrated with the drive wheels themself.
As standard, the double girder trolleys are equipped with limit switches to delimit the transverse run, with emergency buffers consist of two couples of dumper buffers in rubber with high absorption of energy as well as four anti-derailment and anti-drop devices.

TOWING ARM

For all the trolleys "VT" series is available, as optional, the towing arm that connects the trolley to the power supply line. It's easily adjustable in all directions and prevents the tearing of the conductors.

Electric wire rope hoists “VF” series in standard execution

SELF-BREAKING MOTOR

Asynchronous three-phase cylindrical rotor. The casing, made of light alloy, has radiating fins that guarantee high thermal dissipation .The motor is provided in the standard equipment with thermal probes for the protection against overload. The motor is also externally cooled by means of self-ventilation and is produced with single polarity (one speed hoist) or double polarity (two speeds hoist). The brake (electromagnetic with direct current) is designed for a high number of starting and the braking gasket is free of asbestos . The brake is of negative type: that means that it is automatically inserted in case of power failure. Is designed to allow the maximum lifting height of the hook, and to withstand to efforts and wear for the whole lifetime expected by the selected service group FEM/ISO.

REDUCTION GEAR

The gear has parallel axes with three stages, with heat shrink between pinions/shafts and their crowns, it is totally closed and contained in boxes in cast iron and cast light alloy. The cylindrical gears with helicoidally teeth are thermally treated and made of highly resistant steel. The gears are mounted on spherical bearings and are constantly lubricated in an oil bath.

DRUM

Made of steel tube, left hand-lay mechanically grooved, suitable for the perfect housing of the right hand-lay standard rope. The drum, by means of flanges with hubs rotating on lubricated bearings, is supported on the reducer casing while, in the opposite side, is

supported by the casing site of the electrical connections.
Both casing are provided of support feet for the fixing of the hoist and they support also the oscillating beams, both the one where the pulley is and the one containing the anchorage cross head with the overload device.
The casings of the drum are connected by means of screwed staybolts.

ROPE

Made of extra flexible steel, characterized by high resistance to strain and wear, with resistance and safety coefficient according to the Standards EN 12385-4 and ISO 4308-1.
On the electric wire rope hoists "VF" series with drum extra-long, drum lenght E1 and E2, are used non-twist ropes

ROPE GUIDE

Made of a ring composed by two half-rings in cast iron, left hand-lay mechanically grooved in order to match the drum. It guarantees the right inserting and unfolding of the rope.
The function tighten-rope against the loosening is assured by plastic slides that, fitted into the rope guide and located on the external circumference of the rope, are locked around the rope by means of a spring.

HOOK-BLOCK WITH HOOK

Provided with pulleys made in carbon steel with rim grooved mechanically.
The pulleys, rotating on permanently lubricated bearings, are inserted and protected into steel casings suitable designed in order to reduce risks of crushing between the rope and the rim of the pulley itself.
The load single hook, rotating on a thrust bearing, is made in high resistance forged steel and is equipped with safety latch against the accidental release of the load. The hook is fitted on a swinging support.

TRANSVERSE PULLEY

Used only in the electric wire rope hoists "VF" series at 4 and 8 falls, is made of a composed structure where the pulley is located. The pulley is made in carbon steel with rim grooved mechanically . The pulley is rotating on permanently lubricated bearings. The transverse has two support pivots that permit the arranging on the axis of the rope.

ANCHORAGE CROSS HEAD

Is made by a composed structure where are located the terminal wedge and the overload device. The transverse has two support pivots that permit the arranging on the axis of the rope.

TERMINAL WEDGE

It is the fixing device of the terminal rope to the anchorage cross head. It includes a body composed by two plates connected by means of screws, within are located in a floating manner two jaws and the wedge which, by tightening the rope over a large surface, they ensure the best fit and a sure seal within the body of the terminal wedge.

OVERLOAD DEVICE

It is a security device that avoids potentially dangerous situations due to accidental overloads. The overload device, of electromechanical type, is supplied as standard with one tripping threshold set in order to never exceed the value of 125% of the nominal load, as provided by the Standard EN 14492-2, allowing the use in safety of the hoist. On request, the overload device can be supplied with two tripping thresholds and/or different settings.

LIMIT SWITCH

It's a safety device to avoid dangerous situations due to lack of control of the hook run in up/down movement. The electric limit switch (rotary type) is connected with the axe of the drum. It is composed by two precision micro-switches working according to the principle of "slow positive opening" and work on the auxiliary circuit of the control device of the lifting motor.
It is fitted inside the connecting module and is protected against the atmospherics agents (IP 55 protection), it is easy to be calibrated and inspected. On request, the limit switch con be supplied with two tripping thresholds where the second can be connected to the auxiliary circuit of the line contactor or act as selector switch .

BOX ELECTRICAL CONNECTIONS

Equipped with connection box, cable glands and proper terminal board, allows easy and efficient wiring of the electrical connections of the hoist and trolley motors. The box of the electrical connections (and/or of the low voltage control equipment) is equipped with a cover made of self-extinguishing thermoplastic material, with gasket designed to ensure the degree of protection IP 55 according to EN 60529.

ELECTRICAL CONTROLS

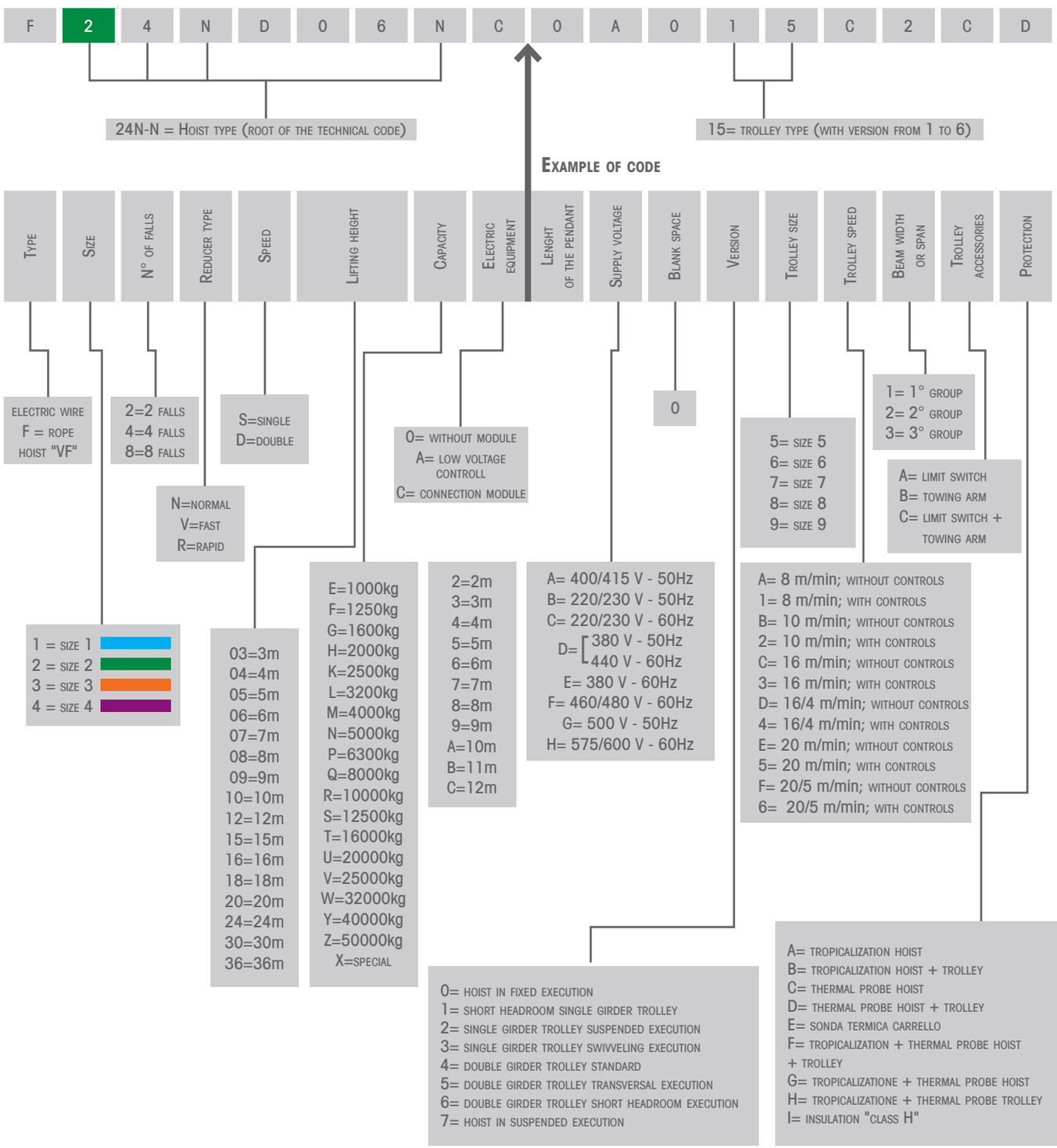
In order to activate the up and down functions and, when provided, the right and left functions of the electric trolley. Is designed and made in compliance with the standard EN 60204-32, while the choice of the components is compliant with the standard EN 60947-5-1.
The electrical control, positioned in its own box into the hoist, includes:

- *Auxiliary circuits in low voltage 110 V in CA, powered by mono-phase transformer, Power circuits (power supply and motors) suitable for three-phases in CA max. 500 V and Equipotential ground circuit;*
- *Mono-phase transformer for the power supply of the low voltage circuit, in compliance with EN 61558 standard;*
- *General line contactor designed in AC2 and Contactors for motor power control, designed in AC3, with electric and mechanic block between opposite functions as well as the contactors for polarity change in case of hoists and/or trolley with two speeds*
- *Protections of main and auxiliary circuits of the transformer;*
- *Terminal block for the connections of the auxiliary and power circuits, Glands for getting in and out of all the users (main power, motors, push button panel, limit switches), equipped with minimum grade protection IP 55, in comply with the standard EN 60529;*
- *Push- button panel with its relative cable equipped with:*
  - *ergonomic shape easily gripping, equipped with controls of immediate access requiring low operating forces;*
  - *external protection box made in shockproof thermoplastic self-extinguishing material , waterproof with protection grade IP 67, in compliance with the EN 6052 standards;*
  - *function buttons with kept action, protect against the accidental control, with electric block and functions remarkable by symbolism in comply with the regulation FEM 9.941/95;*
  - *emergency stop, in compliance with EN 418 and EN 60947-5-1 standards, made up by a red mushroom-head button which puts the control circuit in the forward position by using an intentional release action;*
  - *multipolar electric cable, fire retardant type, equipped with tear proof metallic parts for the push button panel suspension.*

Standard range of the electric wire rope hoists "VF" series

TECHNICAL CODE

The characteristics of the hoist and relative trolley are defined by a code of 18 positions, as shown in the following reading key with example.
The second, third, fourth and eighth position of the code constitute the "Root of the technical code" that defines typologically the wire rope hoist "VF".



THE AVAILABLE RANGE

On the basis of the capacity, service group FEM (ISO) and main speed, the table shows, through the "root of the technical code" the available range of wire rope hoists ***"VF"*** *in different sizes.*

CAPACITY	Group FEM 1Am (ISO M4) Main speed (m/min)				Group FEM 2m (ISO M5) Main speed(m/min)						GroupFEM 3m (ISO M6) Main speed (m/min)					
	8 falls	4 falls	2 falls		8 falls		4 falls		2 falls		8 falls		4 falls		2 falls	
(kg)	2,5	5	8	10	2	3	4	6	8	12	2	3	4	6	8	12
1000										12R-E						
1250															12N-F	12R-F
1600									12N-G	12R-G				14R-G		
2000			12N-H					14R-H							22N-H	22R-H
2500									22N-K	22R-K			14N-K	14R-K	32N-K	32R-K
3200			22N-L				14N-L	14R-L	32N-L	32R-L						
4000													24N-M	24R-M	32N-M	32R-M
5000							24N-N	24R-N	32N-N	32R-N			34N-N	34R-N		42R-N
6300			32N-P				34N-P	34R-P		42R-P					42N-P	
8000									42N-Q	42R-Q			34N-Q	34R-Q		
10000							34N-R	34R-R	42N-R	42R-R	38N-R	38R-R		44R-R		
12500				42V-S	38N-S	38R-S		44R-S					44N-S			
16000							44N-T	44R-T			38N-T	38R-T				
20000					38N-U	38R-U	44N-U	44R-U				48R-U				
25000		44V-V				48R-V					48N-V					
32000					48N-W	48R-W										
40000					48N-Y	48R-Y										
50000	48V-Z															

Features and technical data

Electric wire rope hoists "VF" series													Electric trolleys "VT" series					
Capacity	1) Speed	2) Hoist	3) Installed power	4) Motor	Service group FEM		Rope		Lifting height (m) With drum size				Trolley type					
					Hoist assembly	Motor Brake Ø drum	Fall	Ø					Monorail version			Birail version		
kg	m/min	Type	kW	Type			N°	mm	1	2	3	4	1	2	3	4	5	6
1000	12	12RS-E	2,3	112	2m	>3m	2/1	7	12	20	37	47	15	25	35	46	56	66
	12/3,9	12RD-E	2,3/0,73	112	3m	>3m	2/1	7	12	20	37	47						
1250	8	12NS-F	2,3	112	3m	>3m	2/1	7	12	20	37	47						
	8/2,6	12ND-F	2,3/0,73	112	3m	>3m	2/1	7	12	20	37	47						
	12	12RS-F	3,6	132	3m	>3m	2/1	7	12	20	37	47						
	12/3,9	12RD-F	3,6/1,15	132	3m	>3m	2/1	7	12	20	37	47						
1600	6	14RS-G	2,3	112	3m	>3m	4/1	7	6	10	15	20						
	6/1,9	14RD-G	2,3/0,73	112	2m	>3m	4/1	7	6	10	15	20						
	8	12NS-G	2,3	112	2m	>3m	2/1	7	12	20	37	47						
	8/2,6	12ND-G	2,3/0,73	112	2m	>3m	2/1	7	12	20	37	47						
	12	12RS-G	3,6	132	2m	>3m	2/1	7	12	20	37	47						
	12/3,9	12RD-G	3,6/1,15	132	2m	>3m	2/1	7	12	20	37	47						
2000	6	14RS-H	2,3	112	2m	>3m	4/1	7	6	10	15	20						
	6/1,9	14RD-H	2,3/0,73	112	2m	>3m	4/1	7	6	10	15	20						
	8	12NS-H	3,6	132	1Am	>3m	2/1	7	12	20	37	47						
	8/2,6	12ND-H	3,6/1,15	132	1Am	>3m	2/1	7	12	20	37	47						
	8	22NS-H	3,6	132	3m	>3m	2/1	9	12	20	37	47	16	26	36			
	8/2,6	22ND-H	3,6/1,15	132	3m	>3m	2/1	9	12	20	37	47						
	12	22RS-H	5,4	160	3m	>3m	2/1	9	12	20	37	47						
	12/3,9	22RD-H	5,4/1,7	160	3m	>3m	2/1	9	12	20	37	47						
2500	4	14NS-K	2,3	112	3m	>3m	4/1	7	6	10	15	20						
	4/1,3	14ND-K	2,3/0,73	112	3m	>3m	4/1	7	6	10	15	20	15	25	35			
	6	14RS-K	3,6	132	3m	>3m	4/1	7	6	10	15	20						
	6/1,9	14RD-K	3,6/1,15	132	3m	>3m	4/1	7	6	10	15	20						
	8	22NS-K	3,6	132	2m	>3m	2/1	9	12	20	37	47						
	8/2,6	22ND-K	3,6/1,15	132	2m	>3m	2/1	9	12	20	37	47	16	26	36			
	12	22RS-K	7,2	160	2m	>3m	2/1	9	12	20	37	47						
	12/3,9	22RD-K	7,2/2,25	160	2m	>3m	2/1	9	12	20	37	47						
	8	32NS-K	5,4	160	3m	>3m	2/1	13	12	20	37	47						
	8/2,6	32ND-K	5,4/1,7	160	3m	>3m	2/1	13	12	20	37	47	17	27	37			
	12	32RS-K	7,2	160	3m	>3m	2/1	13	12	20	37	47						
	12/3,9	32RD-K	7,2/2,25	160	3m	>3m	2/1	13	12	20	37	47						
3200	4	14NS-L	2,3	112	2m	>3m	4/1	7	6	10	15	20						
	4/1,3	14ND-L	2,3/0,73	112	2m	>3m	4/1	7	6	10	15	20	15	25	35			
	6	14RS-L	3,6	132	2m	>3m	4/1	7	6	10	15	20						
	6/1,9	14RD-I	3,6/1,15	132	2m	>3m	4/1	7	6	10	15	20						
	8	22NS-L	5,4	160	1Am	>3m	2/1	9	12	20	37	47	16	26	36			
	8/2,6	22ND-L	5,4/1,7	160	1Am	>3m	2/1	9	12	20	37	47						
	8	32NS-L	5,4	160	2m	>3m	2/1	13	12	20	37	47						
	8/2,6	32ND-L	5,4/1,7	160	2m	>3m	2/1	13	12	20	37	47						
	12	32RN-L	7,2	160	2m	>3m	2/1	13	12	20	37	47	17	27	37			
	12/3,9	32RD-L	7,2/2,25	160	2m	>3m	2/1	13	12	20	37	47						

[1] The stated speed are referred to frequency of 50 Hz

[2] Type of hoist defined by the "root of the technical code" with the addition of speed (S or D)

[3] The stated powers are referred to supply voltage of 400 V at 50 Hz

[4] The electrical characteristics of the motors are stated at a pag. 30

Motor type 71 [4]

Motor type 90 [4]

Electric wire rope hoists "VF" series													Electric trolleys "VT" series					
Capacity	1) Speed	2) Hoist	3) Installed power	4) Motor	Service group FEM		Rope		Lifting height (m) With drum size				Trolley type					
					Hoist assembly	Motor Brake Ø drum	Fall	Ø					Monorail version			Birail version		
kg	m/min	Type	kW	Type			N°	mm	1	2	3	4	1	2	3	4	5	6
4000	4	24NS-M	3,6	132	3m	>3m	4/1	9	6	10	15	20	16	26	36	46	56	66
	4/1,3	24ND-M	3,6/1,15	132	3m	>3m	4/1	9	6	10	15	20						
	6	24RS-M	5,4	160	3m	>3m	4/1	9	6	10	15	20						
	6/1,9	24RD-M	5,4/1,7	160	3m	>3m	4/1	9	6	10	15	20						
	8	32NS-M	7,2	160	3m	>3m	2/1	13	12	20	30	47	17	27	37			
	8/2,6	32ND-M	7,2/2,25	160	3m	>3m	2/1	13	12	20	30	47						
	12	32RS-M	11,5	180	3m	>3m	2/1	13	12	20	30	47						
	12/3,9	32RD-M	11,5/3,6	180	3m	>3m	2/1	13	12	20	30	47						
5000	4	24NS-N	3,6	132	2m	> 3m	4/1	9	6	10	15	20	16	26	36			
	4/1,3	24ND-N	3,6/1,5	132	2m	> 3m	4/1	9	6	10	15	20						
	4	34NS-N	5,4	160	3m	> 3m	4/1	13	6	10	15	20	17	27	37			
	4/1,3	34ND-N	5,4/1,7	160	3m	> 3m	4/1	13	6	10	15	20						
	6	24RS-N	5,4	160	2m	> 3m	4/1	9	6	10	15	20	16	26	36			
	6/1,9	24RD-N	5,4/1,7	160	2m	> 3m	4/1	9	6	10	15	20						
	6	34RS-N	7,2	160	3m	> 3m	4/1	13	6	10	15	20	17	27	37			
	6/1,9	34RD-N	7,2/2,25	160	3m	> 3m	4/1	13	6	10	15	20						
	8	32NS-N	7,2	160	2m	> 3m	2/1	13	12	20	30	47						
	8/2,6	32ND-N	7,2/2,25	160	2m	> 3m	2/1	13	12	20	30	47						
	12	32RS-N	11,5	180	2m	> 3m	2/1	13	12	20	30	47						
	12/3,9	32RD-N	11,5/3,6	180	2m	> 3m	2/1	13	12	20	30	47						
	12	42RS-N	14,5	200	3m	> 3m	2/1	17	16	24	43	55	18	28	38			
	12/3	42RD-N	14,5/3,5	200	3m	> 3m	2/1	17	16	24	43	55						
6300	4	34NS-P	5,4	160	2m	> 3m	4/1	13	6	10	15	20	17	27	37	47	57	67
	4/1,3	34ND-P	5,4/1,7	160	2m	> 3m	4/1	13	6	10	15	20						
	6	34RS-P	7,2	160	2m	> 3m	4/1	13	6	10	15	20						
	6/1,9	34RD-P	7,2/2,25	160	2m	> 3m	4/1	13	6	10	15	20						
	8	33NS-P	11,5	180	1Am	> 3m	2/1	13	12	20	30	47						
	8/2,6	32ND-P	11,5/3,6	180	1Am	> 3m	2/1	13	12	20	30	47						
	8	42NS-P	11,5	180	3m	> 3m	2/1	17	16	24	43	55	18	28	38			
	8/2	42ND-P	11,5/3,6	180	3m	> 3m	2/1	17	16	24	43	55						
	12	42RS-P	14,5	200	2m	> 3m	2/1	17	16	24	43	55						
	12/3	42RD-P	14,5/3,5	200	2m	> 3m	2/1	17	16	24	43	55						

1) The stated speed are referred to frequency of 50 Hz

2) Type of hoist defined by the "root of the technical code" with the addition of speed (S or D)

3) The stated powers are referred to supply voltage of 400 V at 50 Hz

4) The electrical characteristics of the motors are stated at a pag. 30

Motor type 71 4)

Motor type 90 4)

Motor type 100 4)

Electric Motors power "VT" Series, related to travelling speed (m/min)								
Motor type	One Speed trolleys				Two Speed trolleys		Variable speed trolleys	
	4 poles motor		2 poles motor		2/8 poles motor		2 poles motor + "inverter"	
	8 m/min	10 m/min	16 m/min	20 m/min	16/4 m/min	20/5 m/min	da 2 a 60 m/min	
71	0,16 kW		0,32 kW		0,32/0,7 kW		0,38 kW	
90	0,25 kW		0,5 kW		0,5/0,12 kW		0,6 kW	
100	0,55 kW		1,1 kW		1,1/0,27 kW		1,3 kW	

Features and technical data

Electric wire rope hoists "VF" series													Electric trolleys "VT" series					
Capacity	[1] Speed	[2] Hoist	[3] Installed power	[4] Motor	Service group FEM		Rope		Lifting height (m) With drum size				Trolley type					
													Monorail version			Birail version		
					Hoist assembly	Motor Brake Ø drum	Fall	Ø										
kg	m/min	Type	kW	Type			N°	mm	1	2	3	4	1	2	3	4	5	6
8000	4	34NS-Q	7,2	160	3m	> 3m	4/1	13	6	10	15	20	17	27	37	47	57	67
	4/1,3	34ND-Q	7,2/2,25	160	3m	> 3m	4/1	13	6	10	15	20						
	6	34RS-Q	11,5	180	3m	> 3m	4/1	13	6	10	15	20						
	6/1,9	34RD-Q	11,5/3,6	180	3m	> 3m	4/1	13	6	10	15	20						
	8	42NS-Q	11,5	180	2m	> 3m	2/1	17	16	24	43	55	18	28	38			
	8/2	42ND-Q	11,5/3,6	180	2m	> 3m	2/1	17	16	24	43	55						
	12	42RN-Q	22,5	200	2m	> 3m	2/1	17	16	24	43	55						
	12/3	42RD-Q	22,5/5,3	200	2m	> 3m	2/1	17	16	24	43	55						
10000	2	38NS-R	5,4	160	3m	> 3m	8/1	13	3	5	7,5	10	=	=	=			
	2/0,6	38ND-R	5,4/1,7	160	3m	> 3m	8/1	13	3	5	7,5	10						
	3	38RS-R	7,2	160	3m	> 3m	8/1	13	3	5	7,5	10						
	3/0,9	38RD-R	7,2/2,25	160	3m	> 3m	8/1	13	3	5	7,5	10						
	4	34NS-R	7,2	160	2m	> 3m	4/1	13	6	10	15	20	17	27	37			
	4/1,3	34ND-R	7,2/2,25	160	2m	> 3m	4/1	13	6	10	15	20						
	6	34RS-R	11,5	180	2m	> 3m	4/1	13	6	10	15	20						
	6/1,9	34RD-R	11,5/3,6	180	2m	> 3m	4/1	13	6	10	15	20						
	6	44RSR	14,5	200	3m	> 3m	4/1	17	8	12	18	24	18	28	38			
	6/1,5	44RD-R	14,5/3,5	200	3m	> 3m	4/1	17	8	12	18	24						
	8	42NS-R	14,5	200	2m	> 3m	2/1	17	16	24	43	55						
	8/2	42ND-R	14,5/3,5	200	2m	> 3m	2/1	17	16	24	43	55						
	12	42RS-R	22,5	200	2m	> 3m	2/1	17	16	24	43	55						
	12/3	42RD-R	22,5/5,3	200	2m	> 3m	2/1	17	16	24	43	55						
12500	2	38NS-S	5,4	160	2m	> 3m	8/1	13	3	5	7,5	10	=	=	=	48	58	68
	2/0,6	38ND-S	5,4/1,7	160	2m	> 3m	8/1	13	3	5	7,5	10						
	3	38RS-S	7,2	160	2m	> 3m	8/1	13	3	5	7,5	10						
	3/0,9	38RD-S	7,2/2,25	160	2m	> 3m	8/1	13	3	5	7,5	10						
	4	44NS-S	11,5	180	3m	> 3m	4/1	17	8	12	18	24	18	28	38			
	4/1	44ND-S	11,5/3,6	180	3m	> 3m	4/1	17	8	12	18	24						
	6	44RS-S	14,5	200	2m	> 3m	4/1	17	8	12	18	24						
	6/1,5	44RD-S	14,5/3,5	200	2m	> 3m	4/1	17	8	12	18	24						
	10	42VN-S	22,5	200	1Am	> 3m	2/1	17	16	24	43	55						
	10/2,5	42VD-S	22,5/5,3	200	1Am	> 3m	2/1	17	16	24	43	55						
16000	2	38NS-T	7,2	160	3m	> 3m	8/1	13	3	5	7,5	10	=	=	=			
	2/0,6	38ND-T	7,2/2,25	160	3m	> 3m	8/1	13	3	5	7,5	10						
	3	38RS-T	11,5	180	3m	> 3m	8/1	13	3	5	7,5	10						
	3/0,9	38RD-T	11,5/3,6	180	3m	> 3m	8/1	13	3	5	7,5	10						
	4	44NS-T	11,5	180	2m	> 3m	4/1	17	8	12	18	24	18	28	38			
	4/1	44ND-T	11,5/3,6	180	2m	> 3m	4/1	17	8	12	18	24						
	6	44RS-T	22,5	200	2m	> 3m	4/1	17	8	12	18	24						
	6/1,5	44RD-T	22,5/5,3	200	2m	> 3m	4/1	17	8	12	18	24						

[1] The stated speed are referred to frequency of 50 Hz
[2] Type of hoist defined by the "root of the technical code" with the addition of speed (S or D)
[3] The stated powers are referred to supply voltage of 400 V at 50 Hz
[4] The electrical characteristics of the motors are stated at a pag. 30

Motor type 90 [4]

Motor type 100 [4]

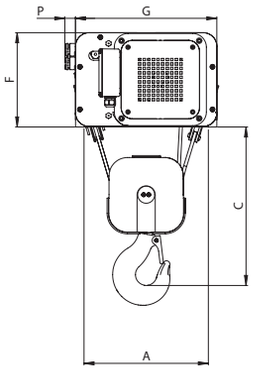
Paranchi elettrici a fune serie "VF"													Carrelli elettrici serie "VT"					
Portata	1) Velocità	2) Tipo	3) Potenza installata	4) Motore	Gruppo di servizio FEM		Fune		Corsa gancio (m) con tamburo misura				Versione del carrello					
													Monotrave			Bitrave		
					Paranco nel suo insieme	Motore Freno Ø tamburo	Tiri	Ø										
kg	m/min		kW	Tipo			N°	mm	1	2	3	4	1	2	3	4	5	6
20000	2	38NS-U	7,2	160	2m	> 3m	8/1	13	3	5	7,5	10	=	=	=	48	58	68
	2/0,6	38ND-U	7,2/2,25	160	2m	> 3m	8/1	13	3	5	7,5	10						
	3	38RS-U	11,5	180	2m	> 3m	8/1	13	3	5	7,5	10						
	3/0,9	38RD-U	11,5/3,6	180	2m	> 3m	8/1	13	3	5	7,5	10						
	3	48RS-U	14,5	200	3m	> 3m	8/1	17	4	6	9	12						
	3/0,9	48RD-U	14,5/3,5	200	2m	> 3m	8/1	17	4	6	9	12						
	4	44NS-U	14	200	2m	> 3m	8/1	17	8	12	18	24	18	28	39			
	4/1	44RD-U	14,5/3,5	200	2m	> 3m	4/1	17	8	12	18	24						
	6	44RS-U	22,5	200	2m	> 3m	4/1	17	8	12	18	24						
	6/1,5	44RD-U	22,5/5,3	200	2m	> 3m	4/1	17	8	12	18	24						
25000	2	48NS-V	11,5	180	3m	> 3m	4/1	17	4	6	9	12	=	=	=	5) 49	5) 59	5) 69
	2/0,5	48ND-V	11,5/3,6	180	3m	> 3m	8/1	17	4	6	9	12						
	3	48RS-V	14,5	200	2m	> 3m	8/1	17	4	6	9	12						
	3/0,7	48RD-V	14,5/3,5	200	2m	> 3m	8/1	17	4	6	9	12						
	5	44VS-V	22,5	200	1Am	> 3m	8/1	17	8	12	18	24						
	5/1,2	44VD-V	22,5/5,3	200	1Am	> 3m	4/1	17	8	12	18	24						
32000	2	48NS-W	11,5	180	2m	> 3m	4/1	17	4	6	9	12						
	2/0,5	48ND-W	11,5/3,6	180	2m	> 3m	8/1	17	4	6	9	12						
	3	48RN-W	22,5	200	2m	> 3m	8/1	17	4	6	9	12						
	3/0,7	48RD-W	22,5/5,3	200	2m	> 3m	8/1	17	4	6	9	12						
40000	2	48NS-Y	14,5	200	2m	> 3m	8/1	17	4	6	9	12						
	2/0,5	48ND-Y	14,5/3,5	200	2m	> 3m	8/1	17	4	6	9	12						
	3	48RN-Y	22,5	200	2m	> 3m	8/1	17	4	6	9	12						
	3/0,7	48RD-Y	22,5/5,3	200	2m	> 3m	8/1	17	4	6	9	12						
50000	2,5	48VS-Z	22,5	200	1Am	> 3m	8/1	17	4	6	9	12						
	2,5/0,6	48VD-Z	22,5/5,3	200	1Am	> 3m	8/1	17	4	6	9	12						

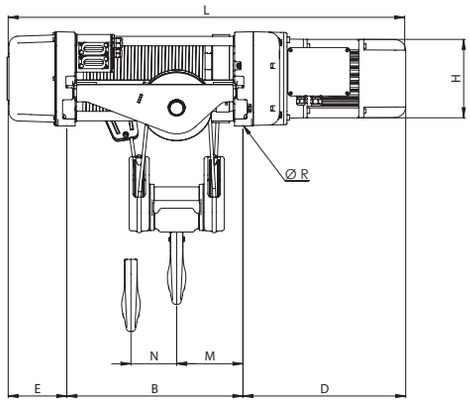
1) The stated speed are referred to frequency of 50 Hz
2) Type of hoist defined by the "root of the technical code" with the addition of speed (S or D)
3) The stated powers are referred to supply voltage of 400 V at 50 Hz
4) The electrical characteristics of the motors are stated at a pag. 30
5) Trolley execution with double motoreducer

Motor type 4)

Electric Motors power "VT" Series, related to travelling speed (m/min)								
Motor type	One Speed trolleys				Two Speed trolleys		Variable speed trolleys	
	4 poles motor		2 poles motor		2/8 poles motor		2 poles motor + "inverter"	
	8 m/min	10 m/min	16 m/min	20 m/min	16/4 m/min	20/5 m/min	da 2 a 60 m/min	
90	0,25 kW		0,5 kW		0,5/0,12 kW		0,6 kW	
100	0,55 kW		1,1 kW		1,1/0,27 kW		1,3 kW	

Electric wire rope hoists VF series at 2 and 4 falls in fixed execution

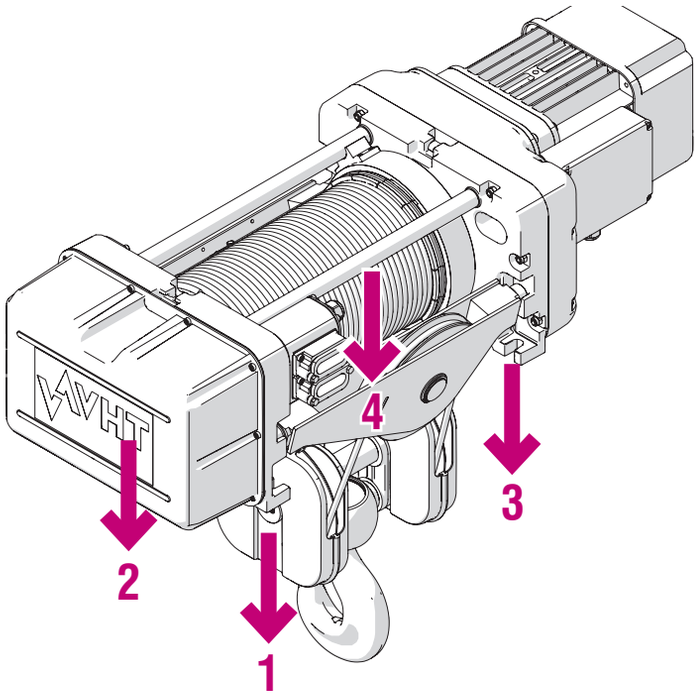




Hoist size VF series	N° off all	Lifting height (m)	Overall dimensions (mm) A	B	C	D	E	F	G	H	L	M	N	P	ØR	Weight (kg)
1	2/1	12	325	450	450	420	160	245	370	210	1030	100	175	32	15	140
		20		670							1250		265			160
		35		1100							1680		360			185
		45		1380							1960		470			205
	4/1	6		450	390						1030	160	100			145
		10		670							1250		180			165
		15		1100							1680		220			190
		20		1380							1960		280			210
2	2/1	12	365	500	520	490	180	275	415	230	1170	110	200	30	17	180
		20		730							1400		290			205
		36		1200							1870		380			220
		46		1490							2160		470			240
	4/1	6		500	465						1170	195	120			190
		10		730							1400		220			215
		15		1200							1870		270			230
		20		1490							2160		330			250
3	2/1	12	470	595	700	600	220	365	540	270	1415	140	250	20	21	450
		20		870							1690		360			550
		37		1490							2310		470			590
		47		1830							2650		590			630
	4/1	6		595	630						1415	250	150			475
		10		870							1690		240			575
		15		1490							2310		270			615
		20		1830							2650		340			645
4	2/1	16	570	790	920	800	240	450	660	305	1830	170	270	15	25	820
		24		1070							2110		370			950
		45		1850							2890		550			1030
		57		2250							3290		710			1160
	4/1	8		790	850						1830	300	170			970
		12		1070							2110		250			1100
		18		1850							2890		300			1180
		24		2250							3290		390			1310

Hoist size VF series	Change in dimensions (mm) and in weights (kg) of hoists VF series in relation to the type of motor used				
	Data in table with motor type	Use of the hoist with oversized motor			
		Type	Increase of dimensions L e D	Increase of dimension H	Increase of weight
1	112	132	dimension in table + 50 mm	dimension in table +20 mm	weight in table +15 mm
2	132	160	dimension in table + 70 mm	dimension in table +40 mm	weight in table +20 mm
3	160	180	dimension in table + 90 mm	dimension in table +35 mm	weight in table +35 mm
4	180	200	dimension in table + 120 mm	dimension in table +45 mm	weight in table +45 mm

Static reactions at the supporting feet



*Reactions caused by static vertical load lifted **Q** with hook in maximum upper position (see quote on p. 22)*

$$R_{Q1} = R_{Q2} = \frac{Q \times M}{2 \times B}$$

$$R_{Q3} = R_{Q4} = \frac{Q \times (B - M)}{2 \times B}$$

*Reactions caused by static vertical load lifted **Q** with hook in maximum lower position (see quote on p. 22)*

$$R_{Q1} = R_{Q2} = \frac{Q \times (M + N)}{2 \times B}$$

$$R_{Q3} = R_{Q4} = \frac{Q \times (B - M - N)}{2 \times B}$$

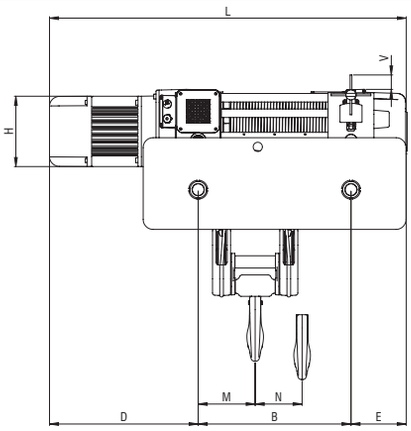
*Reactions vertical static caused by its own weight **G** (the real position of the barycenter of the masses leads to insignificant variations of the values of the reactions)*

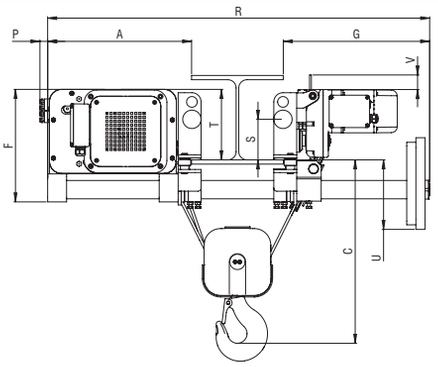
$$R_{G1} = R_{G2} = R_{G3} = R_{g4} = \frac{G}{4}$$

Nota:

- *The values obtained through the formulas above mentioned refer to vertical static reactions to the supporting feet and must be multiplied with the appropriate dynamic coefficients ϕ and composed in accordance with the load combinations defined in the rules of calculation (eg EN 13001-2 , EN 15 011).*
- *The reactions are divided into the components due to the load **Q** and the own weights **G** in order to allow the designer of the supporting structures of the hoist, a correct evaluation applying to each of them a partial safety factor γ_p.*

Electric wire rope hoists VF series at 2 and 4 falls with short headroom monorail trolley

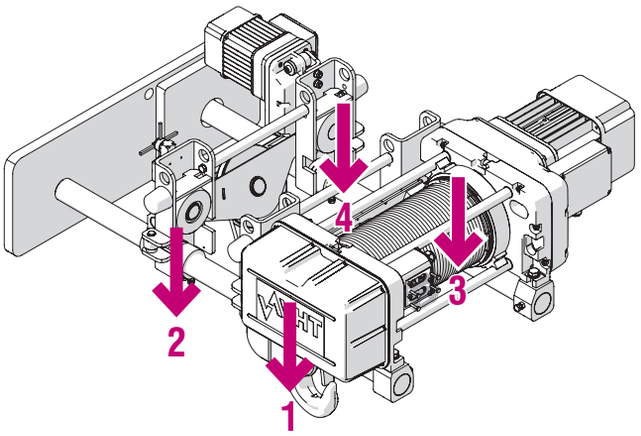




Hoist size VF series	N° of fall	Lifting height (m)	Overall dimensions (mm) A	B	C	D	E	F	G	H	L	M	N	P	R	S	T	U	V	Weight (kg)
1	2/1	12	420	450	710	420	160	330	410	210	1030	100	175	32	1130	120	215	210	48	320
		20		670							1250		265							360
		30		1100							1680		360							415
		40		1380							1960		470							465
	4/1	6		450	580						1030	160	100							325
		10		670							1250		180							365
		15		1100							1680		220							420
		20		1380							1960		280							470
2	2/1	12	470	500	720	490	180	370	480	230	1170	110	200	30	1250	133	230	225	48	380
		20		730							1400		290							420
		30		1200							1870		380							450
		40		1490							2160		470							520
	4/1	6		500	600						1170	195	120							390
		10		730							1400		220							430
		15		1200							1870		270							460
		20		1490							2160		330							530
3	2/1	12	610	595	770	600	220	475	650	270	1415	140	250	20	1560	170	320	270	48	790
		20		870							1690		360							930
		30		1490							2310		470							1100
		40		1830							2650		590							1180
	4/1	6		595	640						1451	250	150							815
		10		870							1690		240							955
		15		1490							2310		270							1125
		20		1830							2650		340							1205
4	2/1	16	750	790	880	800	240	580	800	305	1830	170	270	15	1850	195	350	330	48	1320
		24		1070							2110		370							1620
		36		1850							2890		550							1680
		48		2250							3290		710							1910
	4/1	8		790	790						1830	300	170							1470
		12		1070							2110		250							1670
		18		1850							2890		300							1830
		24		2250							3290		390							2060

Hoist size VF series	Change in dimensions (mm) and in weights (kg) of hoists VF series in relation to the type of motor used				
	Data in table with motor type	Use of the hoist with oversized motor			
		Type	Increase of dimension L e D	Increase of dimension H	Increase of weight
1	112	132	dimension in table + 50 mm	dimension in table +20 mm	weight in table +15 mm
2	132	160	dimension in table + 70 mm	dimension in table +40 mm	weight in table +20 mm
3	160	180	dimension in table + 90 mm	dimension in table +35 mm	weight in table +35 mm
4	180	200	dimension in table + 120 mm	dimension in table +45 mm	weight in table +45 mm

Static reaction to the trolley wheels



*Reactions caused by static vertical load lifted **Q** with hook in maximum upper position (see quote on p. 24)*

$$R_{Q1} = R_{Q2} = \frac{Q \times M}{2 \times B}$$

$$R_{Q3} = R_{Q4} = \frac{Q \times (B - M)}{2 \times B}$$

*Reactions caused by static vertical load lifted **Q** with hook in maximum lower position (see quote on p. 24)*

$$R_{Q1} = R_{Q2} = \frac{Q \times (M + N)}{2 \times B}$$

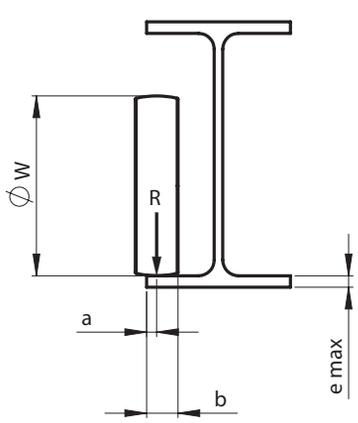
$$R_{Q3} = R_{Q4} = \frac{Q \times (B - M - N)}{2 \times B}$$

*Reactions vertical static caused by its own weight **G** (the real position of the barycenter of the masses leads to insignificant variations of the values of the reactions)*

$$R_{G1} = R_{G2} = R_{G3} = R_{g4} = \frac{G}{4}$$

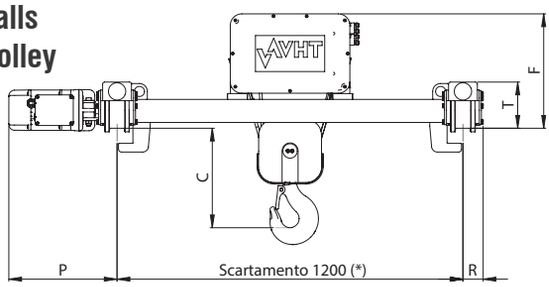
Nota:

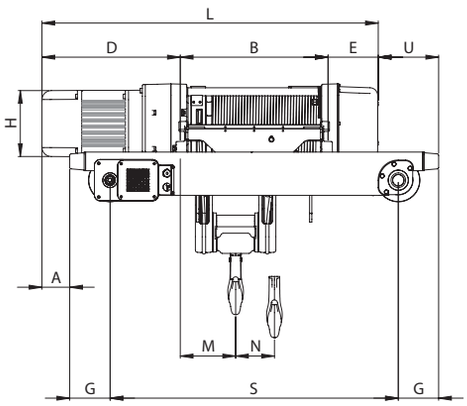
- *The values obtained through the formulas above mentioned refer to vertical static reactions to the supporting feet and must be multiplied with the appropriate dynamic coefficients ϕ and composed in accordance with the load combinations defined in the rules of calculation (eg EN 13001-2 , EN 15 011).*
- *The reactions are divided into the components due to the load **Q** and the own weights **G** so as to allow the designer of the supporting structures of the hoist, a correct evaluation applying to each of them a partial safety factor γ_p.*
- *The horizontal reactions must be calculated on the basis of maximum acceleration at full load equal to 0.16 m/s2 and ϕ coefficients to be evaluated according to the type of drives of the trolley as shown in the reference standards (eg EN 13001 -1, EN 13001-2, EN 15 011).*



Position of the wheels on the beam flange (mm)				
Trolley VT	ØW	a	b	e (max)
15	100	11	31	30
16	125	11	31	30
17	160	14	40	35
18	200	16	50	40

Electric wire rope hoists VF series at 2 and 4 falls with standard birail trolley



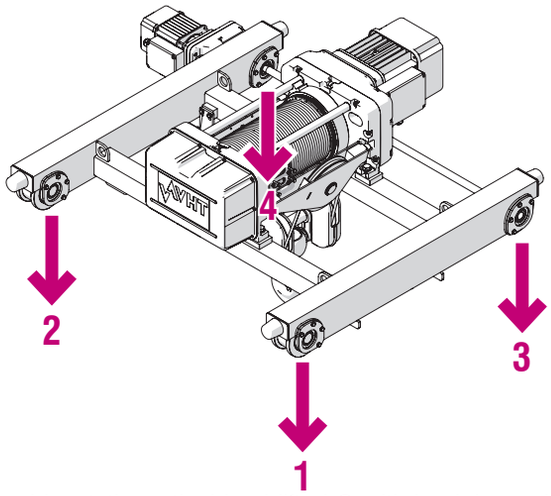


(*) AVAILABLE ALSO WITH EXECUTION WITH SPAN OF 1000 mm OR 1400 mm

HOIST SIZE VF SERIES	N° OF FALL	LIFTING HEIGHT	OVERALL DIMENSIONS (mm)																WEIGHT
		(m)	A	B	C	D	E	F	G	H	L	M	N	P	R	S	T	U	(kg)
1	2/1	12	25	450	340	420	160	370	140	210	1030	100	175	375	70	1000	160	280	250
		20	140	670							1250		265					165	290
		30		1100							1680		360			1470			330
		40		1380							1960		470			1760			365
	4/1	6	25	450	280						1030	160	100			1000		280	255
		10	140	670							1250		180					165	295
		15		1100							1680		220			1470			335
		20		1380							1960		280			1760			370
2	2/1	12	95	500	400	490	180	400	140	230	1170	110	200	375	70	1000	160	210	290
		20	210	730							1400		290					95	335
		30		1200							1870		380			1470			365
		40		1490							2160		470			1760			400
	4/1	6	95	500	345						1170	195	120			1000		210	300
		10	210	730							1400		220					95	345
		15		1200							1870		270			1470			375
		20		1490							2160		330			1760			410
3	2/1	12	153	595	555	600	220	510	160	270	1415	140	250	470	85	1180	192	237	665
		20	290	870							1690		360					100	790
		30		1490							2310		470			1800			860
		40		1830							2650		590			2140			910
	4/1	6	143	595	485						1451	250	150			1180		237	690
		10	280	870							1690		240					100	815
		15		1490							2310		270			1800			885
		20		1830							2650		340			2140			935
4	2/1	16	270	790	730	800	240	640	200	305	1830	170	270	525	95	1450	230	290	1090
		24	410	1070							2110		370					150	1250
		36		1850							2890		550			2230			1400
		48		2250							3290		710			2630			1590
	4/1	8	270	790	660						1830	300	170			1450		290	1240
		12	410	1070							2110		250					150	1400
		18		1850							2890		300			2230			1550
		24		2250							3290		390			2630			1740

HOIST SIZE VF SERIES	CHANGE IN DIMENSIONS (mm) AND IN WEIGHTS (kg) OF HOISTS VF SERIES IN RELATION TO THE TYPE OF MOTOR USED				
	DATA IN TABLE WITH MOTOR TYPE	USE OF THE HOIST WITH OVERSIZED MOTOR			
		TYPE	INCREASE OF DIMENSION L E D	INCREASE OF DIMENSION H	INCREASE OF WEIGHT
1	112	132	dimension in table + 50 mm	dimension in table +20 mm	weight in table +15 mm
2	132	160	dimension in table + 70 mm	dimension in table +40 mm	weight in table +20 mm
3	160	180	dimension in table + 90 mm	dimension in table +35 mm	weight in table +35 mm
4	180	200	dimension in table + 120 mm	dimension in table +45 mm	weight in table +45 mm

Static reaction to the trolley wheels



*Reactions caused by static vertical load lifted **Q** with hook in maximum upper position (see quote on p. 26)*

$$R_{Q1} = R_{Q2} = \frac{Q \times (M + m_o)}{2 \times S}$$

$$R_{Q3} = R_{Q4} = \frac{Q \times (S - M - m_o)}{2 \times S}$$

*Reactions caused by static vertical load lifted **Q** with hook in maximum lower position (see quote on p. 26)*

$$R_{Q1} = R_{Q2} = \frac{Q \times (M + N + m_o)}{2 \times S}$$

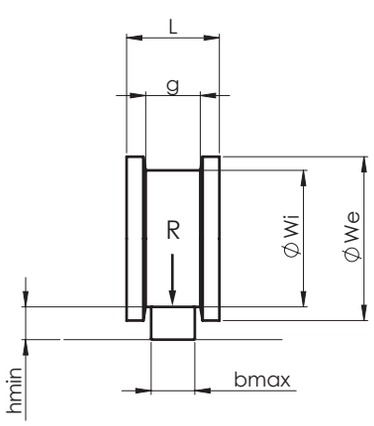
$$R_{Q3} = R_{Q4} = \frac{Q \times (S - M - N - m_o)}{2 \times S}$$

*Reactions vertical static caused by its own weight **G** (the real position of the barycenter of the masses leads to insignificant variations of the values of the reactions)*

$$R_{G1} = R_{G2} = R_{G3} = R_{g4} = \frac{G}{4}$$

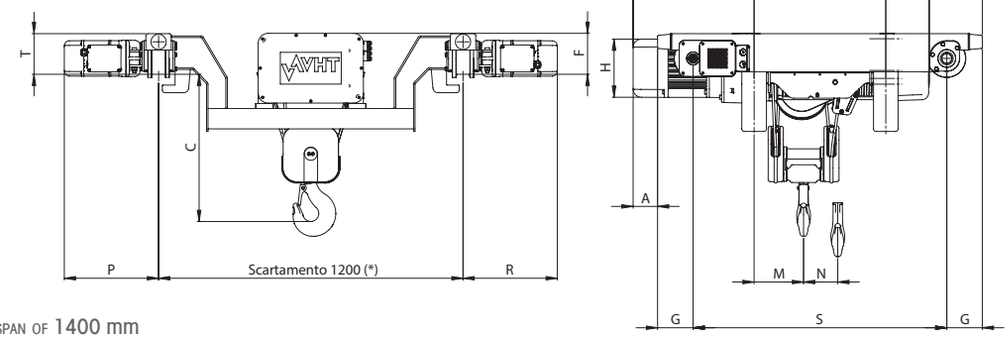
Nota:

- *m_o = D - A - G (see quote on p. 26)*
- *The values obtained through the formulas above mentioned refer to vertical static reactions to the supporting feet and must be multiplied with the appropriate dynamic coefficients ϕ and composed in accordance with the load combinations defined in the rules of calculation (eg EN 13001-2 , EN 15 011).*
- *The reactions are divided into the components due to the load **Q** and the own weights **G** so as to allow the designer of the supporting structures of the hoist, a correct evaluation applying to each of them a partial safety factor γ_p.*
- *The horizontal reactions must be calculated on the basis of maximum acceleration at full load equal to 0.16 m/s2 and ϕ coefficients to be evaluated according to the type of drives of the trolley as shown in the reference standards (eg EN 13001 -1, EN 13001-2, EN 15 011).*



Position of the wheel on the rail of birail trolley (mm)						
Trolley VT	ØWi	ØWe	L	g	h min	b max
46	125	150	85	50	30	40
47	160	190	95	55	30	45
48	200	230	105	60	30	50
49	250	280	115	70	30	60

Electric wire rope hoists VF series at 2 and 4 falls with short headroom birail trolley

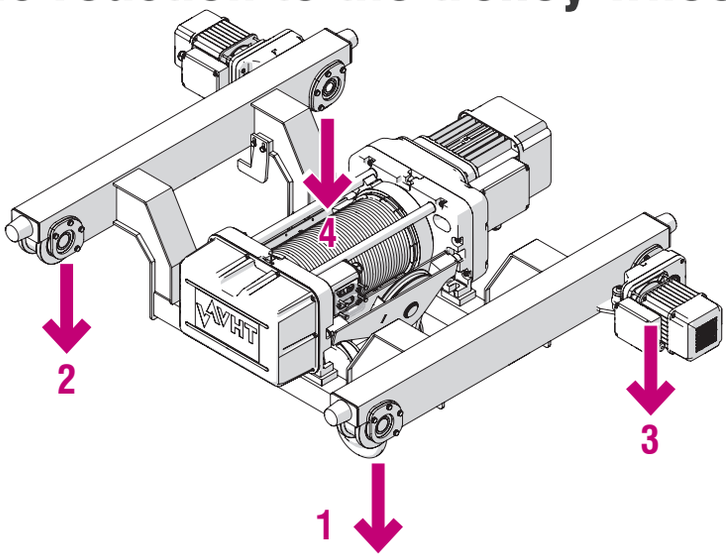


(*) AVAILABLE ALSO IN EXECUTION WITH SPAN OF 1400 mm

HOIST SIZE VF SERIES	N° OF FALL	LIFTING HEIGHT	OVERALL DIMENSIONS (mm)																WEIGHT
		(m)	A	B	C	D	E	F	G	H	L	M	N	P	R	S	T	U	(kg)
1	2/1	12	25	450	550	420	160	160	140	210	1030	100	175	375	375	1000	160	280	265
		20	140	670							1250		265					165	305
		30		1100							1680		360			1470			345
		40		1380							1960		470			1760			380
	4/1	6	25	450	490						1030	160	100			1000		280	270
		10	140	670							1250		180					165	310
		15		1100							1680		220			1470			350
		20		1380							1960		280			1760			385
2	2/1	12	95	500	640	490	180	160	140	230	1170	110	200	375	375	1000	160	210	305
		20	210	730							1400		290					95	350
		30		1200							1870		380			1470			280
		40		1490							2160		470			1760			415
	4/1	6	95	500	585						1170	195	120			1000		210	315
		10	210	730							1400		220					95	360
		15		1200							1870		270			1470			390
		20		1490							2160		330			1760			425
3	2/1	12	153	595	873	600	220	192	160	270	1415	140	250	470	470	1180	192	237	685
		20	290	870							1690		360					100	810
		30		1490							2310		470			1800			880
		40		1830							2650		590			2140			930
	4/1	6	143	595	803						1451	250	150			1180		237	710
		10	280	870							1690		240					100	835
		15		1490							2310		270			1800			905
		20		1830							2650		340			2140			955
4	2/1	16	270	790	1140	800	240	230	200	305	1830	170	270	525	525	1450	230	290	1120
		24	410	1070							2110		370					150	1280
		36		1850							2890		550			2230			1430
		48		2250							3290		710			2630			1620
	4/1	8	270	790	1070						1830	300	170			1450		290	1270
		12	410	1070							2110		250					150	1430
		18		1850							2890		300			2230			1580
		24		2250							3290		390			2630			1770

HOIST SIZE VF SERIES	CHANGE IN DIMENSIONS (mm) AND IN WEIGHTS (kg) OF HOISTS VF SERIES IN RELATION TO THE TYPE OF MOTOR USED				
	DATA IN TABLE WITH MOTOR TYPE	USE OF THE HOIST WITH OVERSIZED MOTOR			
		TYPE	INCREASE OF DIMENSION L E D	INCREASE OF DIMENSION H	INCREASE OF WEIGHT
1	112	132	dimension in table + 50 mm	dimension in table +20 mm	weight in table +15 mm
2	132	160	dimension in table + 70 mm	dimension in table +40 mm	weight in table +20 mm
3	160	180	dimension in table + 90 mm	dimension in table +35 mm	weight in table +35 mm
4	180	200	dimension in table + 120 mm	dimension in table +45 mm	weight in table +45 mm

Static reaction to the trolley wheels



*Reactions caused by static vertical load lifted **Q** with hook in maximum upper position (see quote on p. 28)*

$$R_{Q1} = R_{Q2} = \frac{Q \times (M + m_o)}{2 \times S}$$

$$R_{Q3} = R_{Q4} = \frac{Q \times (S - M - m_o)}{2 \times S}$$

*Reactions caused by static vertical load lifted **Q** with hook in maximum lower position (see quote on p. 28)*

$$R_{Q1} = R_{Q2} = \frac{Q \times (M + N + m_o)}{2 \times S}$$

$$R_{Q3} = R_{Q4} = \frac{Q \times (S - M - N - m_o)}{2 \times S}$$

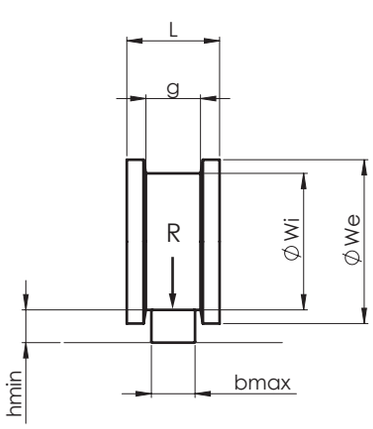
*Reactions vertical static caused by its own weight **G** (the real position of the barycenter of the masses leads to insignificant variations of the values of the reactions)*

$$R_{G1} = R_{G2} = R_{G3} = R_{g4} = \frac{G}{4}$$

Nota:

- *m_o = D - A - G (see quote on p. 28)*
- *The values obtained through the formulas above mentioned refer to vertical static reactions to the supporting feet and must be multiplied with the appropriate dynamic coefficients ϕ and composed in accordance with the load combinations defined in the rules of calculation (eg EN 13001-2 , EN 15 011).*
- *The reactions are divided into the components due to the load **Q** and the own weights **G** so as to allow the designer of the supporting structures of the hoist, a correct evaluation applying to each of them a partial safety factor γ_p.*
- *The horizontal reactions must be calculated on the basis of maximum acceleration at full load equal to 0.16 m/s2 and coefficients to be evaluated according to the type of drives of the trolley as shown in the reference standards (eg EN 13001 -1, EN 13001-2, EN 15 011).*

Position of the wheel on the rail of birail trolley (mm)						
Trolley VT	ØWi	ØWe	L	g	h min	b max
66	125	150	85	50	30	40
67	160	190	95	55	30	45
68	200	230	105	60	30	50
69	250	280	115	70	30	60



Characteristics of the electric motors

Three-phases asynchronous motors, for electric wire rope hoists "VF" series and trolley "VT" series

Motor		Installed power	Polarities	Absorbed current		Power factor	Protection fuses	Power supply cable	
				Nominal In	Starting Ia			Section of the cable Ø	Lenght max.
Uso	Type	kW	N° poles	A	A	Cos. Φ	A	mm²	m
Hoist "VF" series	112	2,3	4	6,8	33	0,7	16	2,5	≤ 30
		2,3/0,73	4/12	6,5/5,3	32/11	0,71/0,5			
		2,75 (*)	4	7,2	36	0,75			
	132	3,6	4	8,8	45	0,72			
		3,6/1,15	4/12	8,5/7	43/16	0,78/0,52			
		4,3(*)	4	9,5	48	0,74			
	160	5,4	4	14	65	0,74	20	4	
		5,4/1,7	4/12	13/11	59/21	0,78/0,55			
		6,5 (*)	4	16	76	0,79			
		7,2	4	18	86	0,78	25		
		7,2/2,25	4/12	17/13	80/25	0,8/0,51			
		8,6 (*)	4	19	91	0,82			
	180	11,5	4	25	110	0,81	32	6	
		11,5/3,6	4/12	24/18	106/30	0,8/0,54			
		13,8	4	27	122	0,84	40		
	200	14,5	4	36	162	0,82	50	10	≤ 20
		14,5/3,5	4/16	35/24	157/45	0,81/0,52			
		17,4	4	38	172	0,84	63		
		22,5	4	46	210	0,84	80	16	
		22,5/5,3	4/16	45/28	200/53	0,82/0,52			
		27(*)	4	52	240	0,85			
trolley t"VT" series	71	0,16	4	0,8	2,8	0,65	4	1,5	≤ 100
		0,32	2	1,2	4,6	0,7			
		0,32/0,07	2/8	0,9/0,7	4,1/1,4	0,75/0,5			
		0,38 (*)	2	1,3	5	0,77			
	90	0,25	4	1,1	4,3	0,68			
		0,5	2	1,4	5,2	0,75			
		0,5/0,12	2/8	1,3/1,1	4,9/1,8	0,82/0,55			
		0,6 (*)	2	1,5	5,7	0,78			
	100	0,55	4	1,6	6,1	0,73	6		≤ 70
		1,1	2	2,7	11	0,81			
		1,1/0,27	2/8	2,6/1,7	9,8/3,1	0,82/0,55			
		1,3 (*)	2	2,9	13	0,84			

Characteristics referred at motors with supply voltage of 400 V and frequency of 50 Hz;
(*) Motors suitable for frequency converter ("inverter") with limit of use of min. 5 Hz and max. 60 Hz.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