HOFFMANN TECHNICS AG
Elektroanlagen

POWER AND DRIVE SYSTEMS

AT24 SD-UD

For mining & minerals

Low voltage industrial drive

Low voltage VFD AT24 SD-UD for mining & minerals

Perfomance in **tough environments.**

Introducing the AT24 SD-UD subline: an advanced, powerful, dust-proof drivesspecifically designed for the mining and processing industries. Featuring a robust, protective housing design, these drives are the ideal choice for reliable, trouble-free operation in mines and challenging environments at high altitudes.

The drive design is based on a NEMA 4-rated enclosure for all electrical components, featuring a highly efficient and easy-to-maintain heat exchanger, power cells, and components that have proven themselves in the AK06 UD line for the oil industry as reliable, effective, and resistant to extreme operating conditions. These components ensure stable operation of the equipment in the most demanding environments, guaranteeing maximum performance and durability. By utilizing advanced technology and materials, our solutions meet the stringent requirements of the industry, allowing your systems to operate without interruption and with minimal maintenance.

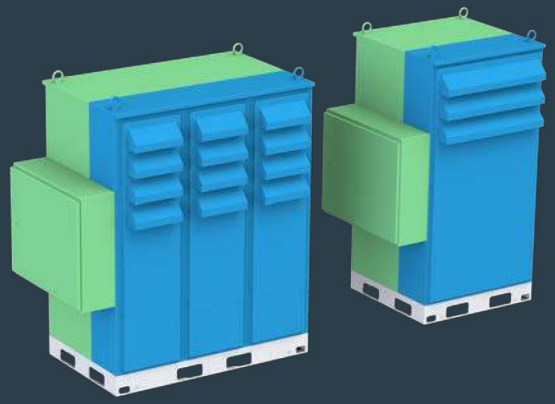
Benefits

Reliability at extreme altitudes

Ensures stable and highly efficient operation at altitudes of up to 4,500 meters, making it ideal for mining and other demanding high-altitude environments.

Dust resistance

The VFD is designed for reliable operation in environments with high dust and abrasive particle content, ensuring trouble-free performance in even the most demanding conditions.

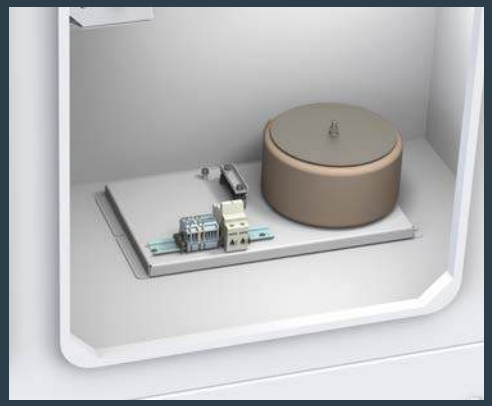


Efficient heat exchanger

The heat exchanger quickly and efficiently dissipates heat, preventing internal components from overheating and extending the VFD's lifespan.

Integrated transformer for control and cooling system

The VFD features an integrated transformer, greatly simplifying installation and operation, particularly in space-constrained environments.



Terminal boards in a separate compartment

The VFD includes a separate terminal board compartment, simplifying and speeding up the rewiring of power and user connections, even in the most demanding environments.

Convenient maintenance of the cooling system

Easy access to the heat exchanger simplifies cleaning and maintenance, reducing downtime and ensuring stable operation in dusty environments.

Motor control of AT24 SD-UD

Algorithms for motor control

- Master-slave operation of induction motor vector control for mechanically coupled motors
- Algorithm for handling supply voltage subsidence
- Catch on the fly on the motor coasting
- Operation in part-power mode
- Motor autotuning (with & without rotation)
- Kinetic buffering

	Speed control accuracy better than	Torque control accuracy better than
Sensorless vector control (open-loop) provides:	0,1% of the rated speed	5% of the rated value
Sensor vector control (closed-loop) provides:	10% of the rated motor slip	10% of the rated value

Technical parameters of AT24 SD-UD

Input parameters

Parameter	Value
Rated input voltage, V	3x460 (-15 % ...+10 %)
Rated frequency, Hz	60 (-5 %...+5 %)

Output parameters

Parameter		Value
Output current, A		216...825
Output frequency, Hz		0...400
Readability frequency reference Hz		0.1/0.01
Acceleration / deceleration time, s		1...4000
Overload characteristic,%	Rated mode:	120% rated output current of the VFD during 60 s
	Rated mode:	150% rated output current of the VFD during 60 s
Efficiency, %		up to 98

EMC compliance

IEC / EN 61800-3 categories C3

Motor control

Parameter	Value
Control methods	• Open loop vector control • Closed loop vector control • Scalar voltage/frequency (V/f) control (5 points)
PWM frequency, kHz	1.5...10
Speed range	• 1: 100 in open loop • 1: 1000 in a closed loop
Speed accuracy (static)	• ± 10% of nominal motor slip in open loop system • ± 0.1% of nominal speed in closed loop systems
Torque accuracy	• ± 10% of rated torque in open loop • ± 5% of nominal torque in closed loop system
Deceleration	Frequency/Coasting
Acceleration/deceleration	S-curve, linear

Interface

Parameter	Value
Light signaling	“Ready”, “Run”, “Fault”, Wi-Fi”
Control	• Wi-Fi control via built-in web interface • Monochrome, 2 / TFT, 2.6 (optional)

Control circuits

Parameter	Value
User power supply	= 10 V, no more than 30 mA = 24 V, no more than 150 mA
Number of digital inputs	6 (NPN/PNP)
Discrete inputs	6 programmable digital inputs 1 pulse discrete input (up to 50 kHz) 1 x Safe torque off (STO) input
Discrete input type	24 V
Number of relay outputs	2
Characteristics of relay outputs	250 V, 2 A
Discrete outputs	1 discrete output of the open collector type 24 V, Current 100 mA
Number of analog inputs	2
Type of analog input	0...10 V 4...20 mA Program selection of channel operation mode
Main function analog input	Frequency setting, signal level control, conversion of signal into SI units, PID controller control or feedback source
Number of analog outputs	2
Analog output type	0 ... 10 V 4 ... 20 mA Program selection of channel operation mode
Analog input type termo	8 (PT100/PT1000)

Data transfer

Parameter	Value
Physical Interface	2 wire RS-485 for Modbus
Modbus data protocol type	Modbus RTU
Data transfer	115200 bps default 9600... 1500000 bps
Data format	8 bits, 1 stop bit, no parity
Number of addresses	1 ... 255 for Modbus
Access type	Slave

Wireless connection

Parameter	Value
Wi-fi	2,4...2,5 GHz

Design

Parameter	Value
Enclosure	• NEMA 3R cooling cabinet • NEMA 4 control cabinet
Housing material	Carbon steel Stainless steel - optional
Cooling type	Air forced, heat exchanger
Instalation	Floor mounting
Maintenance	Four-side
Cable entry	Bottom

Protections

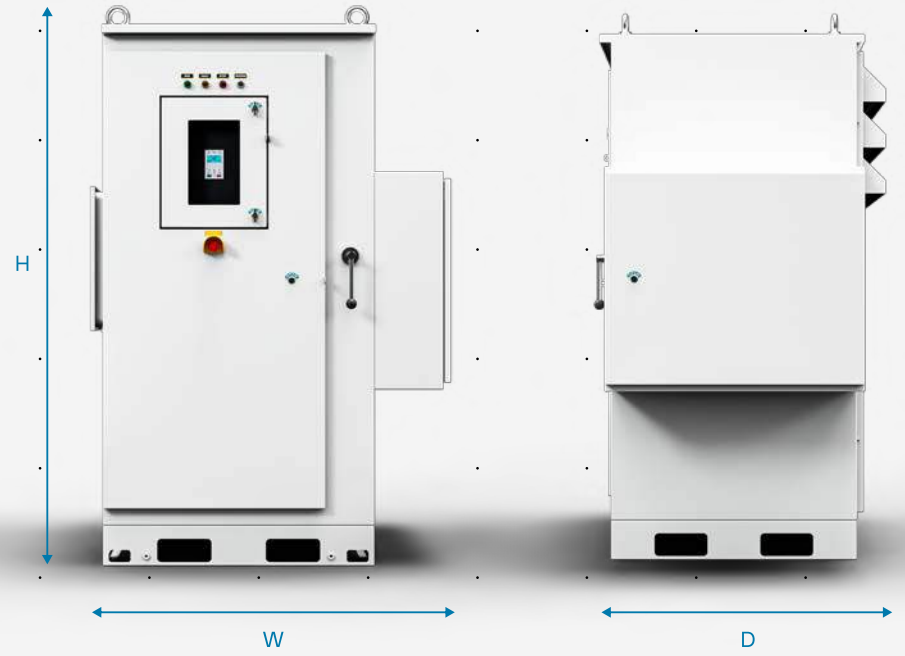
Parameter	Value
Power protection	Phase loss Incorrect phase rotation Overvoltage Undervoltage Voltage imbalance (no more than 3%)
Motor protection	Overload Incomplete load Phase loss Current Imbalance Open circuit of the encoder Open circuit of the braking resistor
VFD protection	Overload Overheating of power switches Overheating of the VFDs internal cabinet (controller overheating) Overcurrent protection Power switch emergency shutdown
Isolation type	Galvanic isolation between power circuits and user circuits
Insulation resistance	>1 MOhm

Terms of use

Parameter	Value
Accommodation conditions	Indoors/ Outdoors
Operating temperature without derating	-10...+40 ˚C (14 F ... 104 ˚F) +50 ˚C (122 oF) with power reduction
Storage temperature	-50...+70 ˚C (-48...158 ˚F)
Humidity	95% Maximum (Non-Condensing)
Height above sea level, m	Up to 4500 m (14 763 ft) - at rated power

Model range of AT24 SD-UD

Nomenclature	Normal Duty			Heavy Duty			Overall dimensions					
	Power		Current	Power		Current	Width		Height		Depth	
	kW	hp	A 380/480	kW	hp	A 380/480	mm	inch	mm	inch	mm	inch
AT24-M13-4-SD-UD	11	15	25 21	7.5	10	17 14	600	23.6	2200	86.6	795	31.2
AT24-M16-4-SD-UD	15	20	32 27	11	15	25 21	600	23.6	2200	86.6	795	31.2
AT24-M20-4-SD-UD	18	25	37 34	15	20	32 27	600	23.6	2200	86.6	795	31.2
AT24-M26-4-SD-UD	22	30	45 40	18	25	37 34	600	23.6	2200	86.6	795	31.2
AT24-M32-4-SD-UD	30	40	60 52	22	30	45 40	600	23.6	2200	86.6	795	31.2
AT24-M40-4-SD-UD	37	50	75 65	30	40	60 52	600	23.6	2200	86.6	795	31.2
AT24-M45-4-SD-UD	45	60	90 77	37	50	75 65	600	23.6	2200	86.6	795	31.2
AT24-M52-4-SD-UD	55	75	110 96	45	60	90 77	600	23.6	2200	86.6	795	31.2



* The manufacturer reserves the right to change the overall dimensions of the product without notifying the end user. Please check VFD dimensions with your Hoffmann representative before ordering.