

MODBUS CODES for VTS EC MOTORS, Level 1

VTS EC Motors to VTS Product:

| New Air Curtain | | | | | |
|-----------------|-----------------|----------------|-----------------|----------------|-----------------|
| Model | VTS article No. | Model | VTS article No. | Model | VTS article No. |
| WING W100 (EC) | 1-4-2801-0055 | WING E100 (EC) | 1-4-2801-0058 | WING C100 (EC) | 1-4-2801-0061 |
| WING W150 (EC) | 1-4-2801-0056 | WING E150 (EC) | 1-4-2801-0059 | WING C150 (EC) | 1-4-2801-0062 |
| WING W200 (EC) | 1-4-2801-0057 | WING E200 (EC) | 1-4-2801-0060 | WING C200 (EC) | 1-4-2801-0063 |

| New Volcano Air Heaters | | |
|-------------------------|------------|---------------|
| Model | Power [kW] | Volcano EC |
| VOLCANO VR MINI EC | 3-20 | 1-4-0101-0455 |
| VOLCANO VR1 EC | 5-30 | 1-4-0101-0442 |
| VOLCANO VR2 EC | 8-50 | 1-4-0101-0443 |
| VOLCANO VR3 EC | 13-75 | 1-4-0101-0444 |
| Destratificator | | |
| VOLCANO VR-D EC | | 1-4-0101-0450 |

Default network configuration

MODBUS RTU: 19200-8-N-1

Slave addr: 0x01

(Gray text indicates partially implemented or unimplemented function)

Coils

| Address | Function | Range | Description |
|---------|------------------|-------|----------------------------------|
| 0 | Motor ON/OFF | 0..1 | Indication only 1: ON, 0: OFF |
| 1 | Reset Controller | 0..1 | 1: Reset controller immediately |
| 2 | Fire active | 0..1 | 1: Fire mode active |

Discrete status bits (inputs)

| Address | Function | Range | Description |
|---------|-----------------|-------|---|
| 0 | UnderVoltage | 0..1 | 1: Voltage too low to run |
| 1 | OverVoltage | 0..1 | 1: Voltage too high to run |
| 2 | IGBTOvercurrent | 0..1 | 1: Hardware protection tripped |
| 3 | Hot | 0..1 | 1: Temperature protection active, power reduced |
| 4 | PhaseLoss | 0..1 | 1: Phase or motor sync loss |
| 5 | PFCOvercurrent | 0..1 | 1: PFC FET protection tripped |
| 6 | ParametersCRC | 0..1 | 1: Parameter checksum failed (TBD) |

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| | | | |
|--------|----------------|------|---|
| 7 | CircuitFault | 0..1 | 1: There was an error detected during circuit internal check |
| 8 | MotorFault | 0..1 | 1: Motor does not behave as expected |
| 9 | TooHot | 0..1 | 1: Converter too hot to operate |
| 10 | I2R IGBT Fault | 0..1 | 1: Software IGBT protection triggered |
| 11..13 | RESERVED | | |
| 14 | RestartFault | 0..1 | 1: Fault condition repeated several times in a short time. Converter power should be power cycled or reset. |
| 15 | OnFire | 0..1 | 1: Fire input was activated |
| 16 | RunActive | 0..1 | 1: Run input was activated |
| 17 | RelayActive | 0..1 | 1: Relay output is active |
| 18 | WaitingToStop | 0..1 | 1: Motor should be stopped, but is still spinning |
| 19..23 | RESERVED | | |
| 24 | RpmReg | 0..1 | Speed regulator active |
| 25 | PowerReg | 0..1 | Power limit regulator active |
| 26 | IacReg | 0..1 | Line current regulator active |
| 27 | OvermodReg | 0..1 | Overmodulation reached. Converter can no longer supply the voltage required by motor. |
| 28 | RegenReg | 0..1 | Motor is in regeneration. Speed increased to prevent DC link overvoltage. |
| 29 | IphaseReg | 0..1 | RMS motor phase current limit reached |
| 30 | SyncReg | 0..1 | Motor is still in synchronous mode |
| 31 | RESERVED | 0..1 | |

Access Levels:

0 – read only

1 – Basic user settings Password: **1**

2 – Service

3 – Factory setting

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| Holding Registers | | | | | | |
|-------------------|-----------|--|------------|---|-------|--|
| Address | Function | Range | Resolution | Description | Level | |
| 0 | Setpoint | 0..10000 | 0.01% | Performance setpoint. <700: Motor OFF >1000: Motor ON Mode 0: AN1 or POT demand. Mode 2: MODBUS set value Mode 11, 12: PID regulator output. | 1 | |
| 2 | MaxRPM | MinRPM.. MaxRPM[level+1] | 1 | Max rpm allowed in normal operation. External control will use this as setpoint maximum. Value from level above current is used as Max. | 1 | |
| 3 | FireSpeed | $\frac{2}{3} * \text{MaxRPM}[\text{level}2]$.. MaxRPM[level2] | 1 | RPM when fire mode is active ($\frac{2}{3} * \text{RPM_MAX}$ to RPM_MAX) | 1 | |
| 4 | MinRPM | MinRPM[level+1].. MaxRPM | 1 | Minimal allowed speed. Value from level above current is used as Min. | 1 | |
| 5 | Password | 0-65535 | | 0: level 0, all settings locked (default password for level 1) 1: password for current level will be disabled with 10020 | | |

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| | | |
|---|------|--|
| | | <p>10000: store values to EEPROM at current level (will override lower levels)</p> <p>10001: restore values from EEPROM (last saved values)</p> <p>10002: restore default values from one level above current</p> <p>10020: set previous value as password (will not be accepted if desired password matches 10000..11000 or level is <1) See 1: for how to disable password.</p> |
| 6 | Mode | <p>0: AN1 or POT Speed, 1: AN1 Torque, 2: MODBUS Speed (run switch inactive), 3: MODBUS Torque, 11: AN1-AN2 Speed regulator (heat), 12: AN2-AN1</p> <p style="text-align: right;">1</p> |

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| | | | | | |
|----|----------------|------------|-------------------------------|---|---|
| 7 | ModbusAddress | 1..247 | 1 | Set modbus address: write 10000 to password to save. Restore by writing to broadcast address (0). | 1 |
| 11 | Kp | 100..32000 | 0.001 (0.1 min, 32 max) | External controller proportional gain | 1 |
| 12 | Ti | 0..32000 | 0.1s (3200s max) | External controller Integration time 0: no integration | 1 |
| 13 | Td | | | External controller diff. time | 1 |
| 14 | PIDMin | 0..10000 | 0.01% | PID regulator minimum output | 1 |
| 15 | PIDMax | 0..10000 | 0.01% | PID regulator maximum output | 1 |
| 16 | PIDRef | 0..10000 | 0.01% | PID regulator reference selection | 1 |
| 24 | RESERVED | | | | |
| 28 | Resonance1 | 0..10000 | 1 | Rpm where 1 st resonance occurs (set 0 to ignore). Converter will avoid this rpm. Avoidance will only work if rpm regulator is active. | 1 |
| 29 | Resonance2 | 0..10000 | 1 | 2 nd resonance. | 1 |
| 30 | Resonance3 | 0..10000 | 1 | 3 rd resonance. | 1 |
| 31 | ResonanceWidth | 2..20% | 1 | Width of | 1 |

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| | | | | | |
|--------------------------|------------------|-----------|-------|---|---|
| | | | | resonance avoidance band. Example: R28=1000, R31=20 Converter will avoid 900-1100 rpm. | |
| Controller configuration | | | | | |
| 100 | SO output mode | 0..9 | | SO output Mode: 0: disabled (input), 1: FREQ(25mA), 2: FREQ(10V, 1mA), 3: PWM(25mA), 4: PWM(10V,1mA) 5: 0..20mA, 6: 0..10V(1mA), 7: 4..20mA, 8: 2..10V(1mA), 9: AN1 style rpm output. | 1 |
| 101 | SO output signal | -10000..2 | 0.01% | <1: Manual output value (-10000=100%) 1: Motor.RPM, 2: SetPoint, >2: reserved | 1 |

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|-----|---------|---------|-------|---|---|
| 107 | AN1Max | 0..2400 | 0.01V | Voltage for maximum setpoint. Transfer function is inverted if AN1Max > AN1Min. | 1 |
| 108 | AN1Min | 0..2400 | 0.01V | Voltage for minimum setpoint. | 1 |
| 109 | AN1Stop | 0..2400 | 0.01V | 0: disable stop >0: Stop threshold voltage. | 1 |

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| Input Registers (also available as Holding Registers at 1000+) | | | | |
|--|-----------------------|------------|------------|--|
| Address | Function | Range | Resolution | Description |
| 0 | HWVersion | | 1 | Hardware version |
| 1 | FWVersion | | 1 | Firmware version |
| 2..3 | Reserved | | | |
| 4 | Speed | 0..32767 | 1 | RPM |
| 5 | Controller temperatur | -50..150 | 0.01 | °C |
| 6 | UDC | | 0.1 | DC Bus Voltage in V |
| 7 | StatorIRMS | | 0.001 | RMS Stator current in A |
| 8 | Power | | 0.1 | W |
| 9 | Analog1 | -300..2000 | 0.01V | Analog input 1 voltage |
| 10 | Analog2 | -300..2000 | 0.01V | Analog input 2 voltage |
| 11 | AnalogPOT | -300..2000 | 0.01V | Analog POT voltage |
| 12 | SO voltage | -300..2000 | 0.01V | SO output voltage |
| 13 | SO current | -300..3300 | 0.01mA | SO output current |
| 14 | IAC | | 0.001 | Line RMS current in A |
| 15 | RESERVED | | | |
| 16 | RESERVED | | | |
| 17 | RESERVED | | | |
| 18 | RESERVED | | | |
| 19 | ErrorCode | 0..7, -1 | | Red LED error codes (priority in the order below): 7 = motor failed to start repeatedly 6 = under or overvoltage 5 = motor misconnected/faulty 4 = internal frequency converter fault 3 = temperature protection active 2 = active overcurrent protection 1 = slow blink=standby -1 = fast blink (fire activated) 0 = always on (operating normally) |
| 20 | FireMinutes | | | Minutes under fire mode. |
| 21 | FireDays | | | Days under fire mode. |
| 22 | FireCycles | | | Fire activated counter. |
| 23 | OpMinutes | | | Minutes of operation. |
| 24 | OpDays | | | Days of operation (RPM>0, no error). |



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OWN NOTICE: