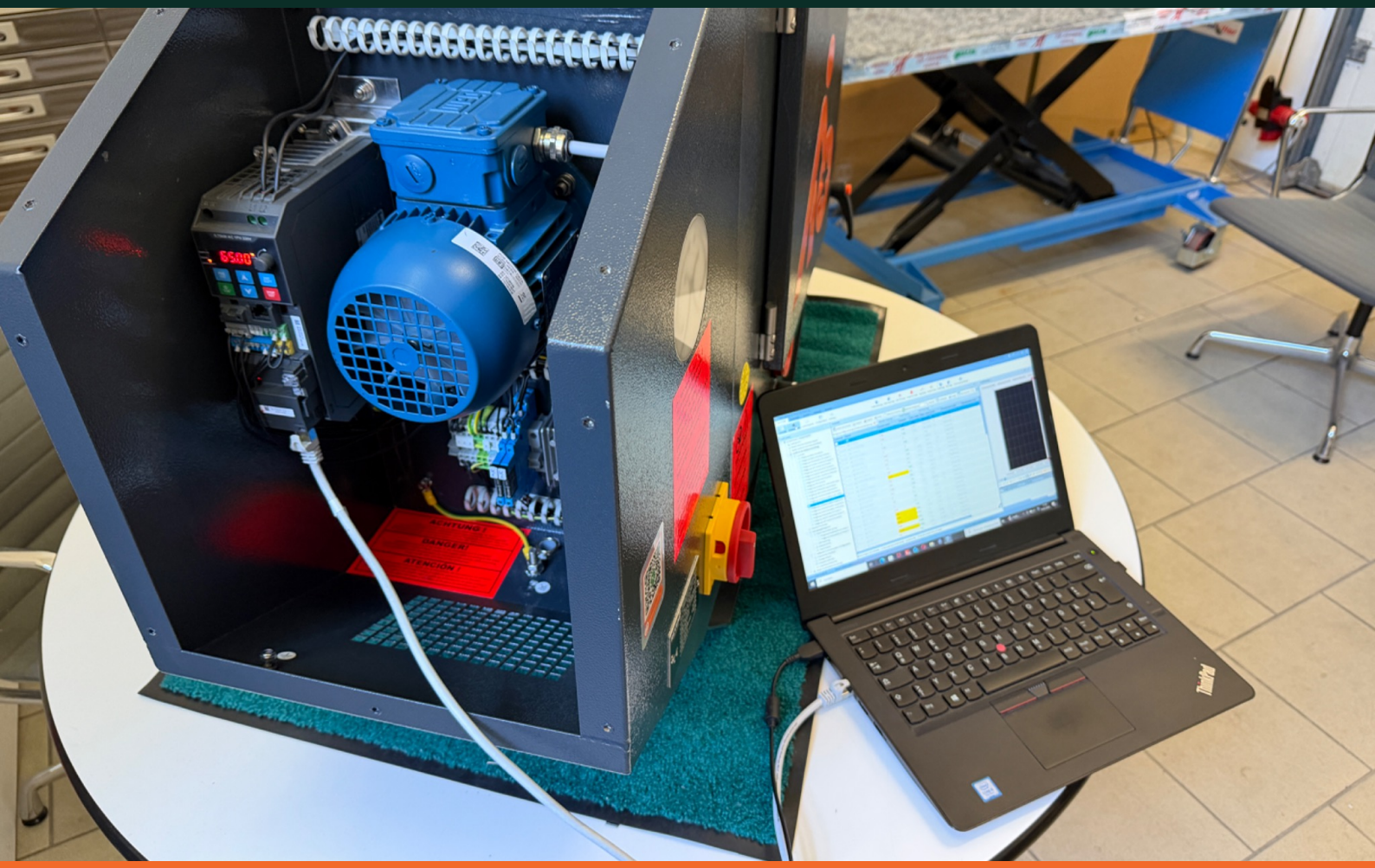


XSC GUIDE 2026

REVEN XSC GUIDE

GREEN LIGHT IS NOT ENOUGH.

How REVEN XSC technology turns an air cleaner into a monitored and optionally connected system.

CONTROL | CONDITION MONITORING | OPTIONAL CONNECTIVITY

TECHNICAL GUIDE

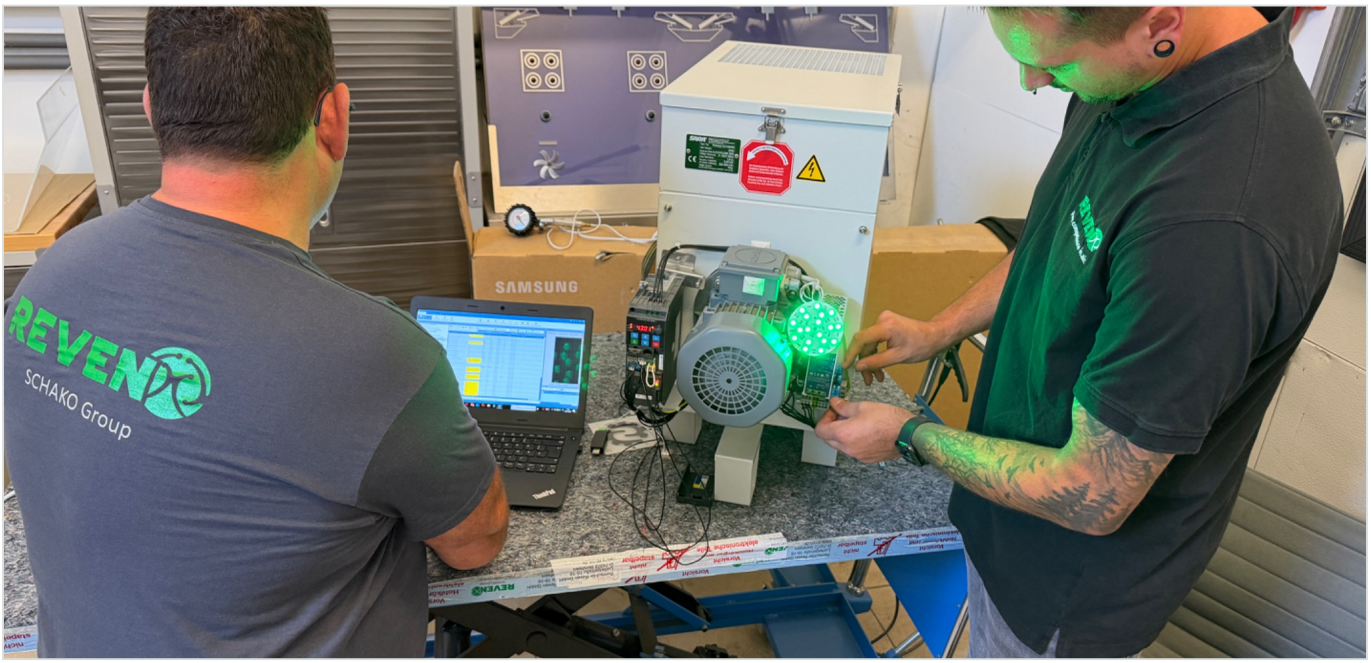
PRE-PRODUCTION STATUS 29 JULY 2026

English | Version 1.2 | Subject to technical changes and errors

REVEN
SCHAKO Group

First-hand practical expertise

The XSC Guide combines experience from development, service and real-world testing with clear answers for sales partners.



Zoltan Kiss (left) and Oliver Schäfer (right) during parameterisation and functional testing of the pre-production setup.

What this guide contains

1:47:37
TECHNICAL INTERVIEW

80
PRACTICAL QUESTIONS

576
TECHNICAL PAGES

11
PRACTICAL PHOTOS

Person	Focus in the technical interview
Sven Rentschler	Moderation, customer perspective and critical sales questions
Zoltan Kiss	Software, characteristic map, parameters and variable frequency drive
Oliver Schäfer	Product, service, implementation and customer benefits

How to use this guide

The main section explains benefits, function and application. The technical appendix provides concise answers and clear boundaries for consulting, engineering and service.

Guide overview

The main section explains benefits and technology. In the appendix, sales partners will find 80 concise answers for consulting and service.

Current development status

This guide describes the target technical architecture of the new GD28 generation. On 29 July 2026, it is at the pre-production stage. Early 2027 was stated as the target; this date is not binding.

Operation does not equal performance

A green operating lamp and an audibly running fan do not yet prove effective extraction.

THE KEY MESSAGE

GREEN LIGHT IS NOT ENOUGH.

On simple systems, green often means only that voltage is present. Airflow, filter condition and effective capture remain invisible.

What the operator hears and sees

Motor noise + green lamp = operating signal

≠

Proof of the required extraction performance

- A contaminated filter can greatly reduce airflow even though the fan continues to run.
- Insufficient make-up air, excessively long ducting or too many bends also increase system resistance.
- XSC makes a defined operating condition visible—within a calibrated application window.

When extraction performance is lost unnoticed

Insufficient capture affects not only the filter, but also people, machinery, the production hall and the process.

1 Employees

If negative pressure is insufficient inside the machine enclosure, aerosols can escape into the breathing zone when the door is opened. Exposure increases even though the air cleaner is audibly running.

2 Machine tool

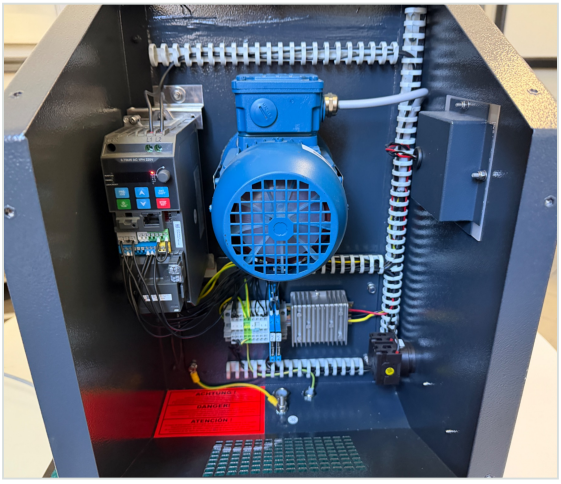
Oil mist can penetrate electronics, control cabinets and sensitive computer equipment. Residues and plasticisers place stress on components and increase cleaning effort.

3 Production hall

Aerosols settle on surfaces and walkways. Visible contamination, odours and slippery deposits can impair the working environment and safety.

4 Process reliability

A machine may continue producing even though capture is no longer sufficient. Without feedback, the critical condition remains hidden until a visual inspection or fault occurs.



The real risk

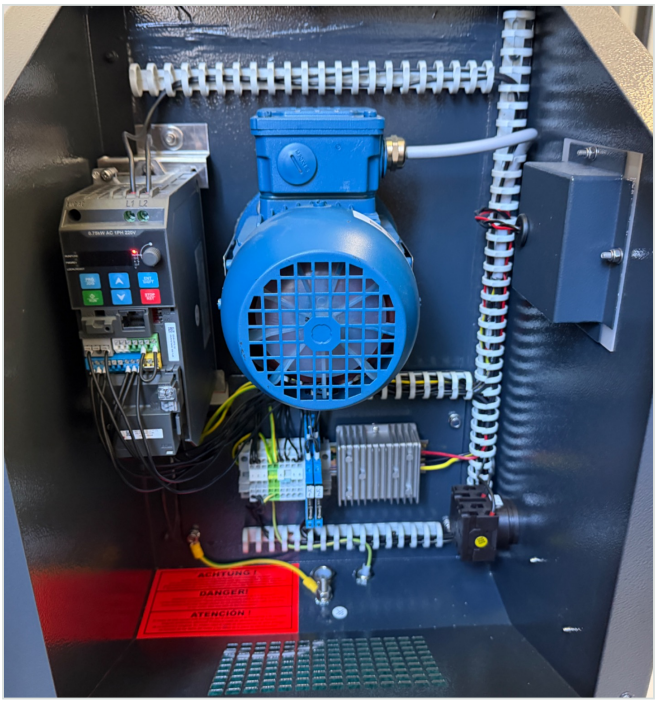
The problem is not a visible standstill, but unnoticed performance loss during apparently normal operation. XSC addresses precisely this information gap.

Practical rule

A status indicator does not replace correct system design. It helps make deviations visible and initiate maintenance in a targeted manner.

XSC in one sentence

XSC stands for X-CYCLONE® Speed Control and combines the fan drive with unit-specific REVEN logic, a status indicator and optional communication.



30 SECONDS FOR OPERATORS

XSC detects changes in operating condition, adjusts fan speed within defined limits and indicates in good time when cleaning or a fault check is required.

FOR AUTOMATION ENGINEERS

The variable frequency drive records motor current. A model-specific REVEN characteristic evaluates current and frequency. As system resistance increases, frequency is raised step by step; defined thresholds control the indicator.

Components of the complete system

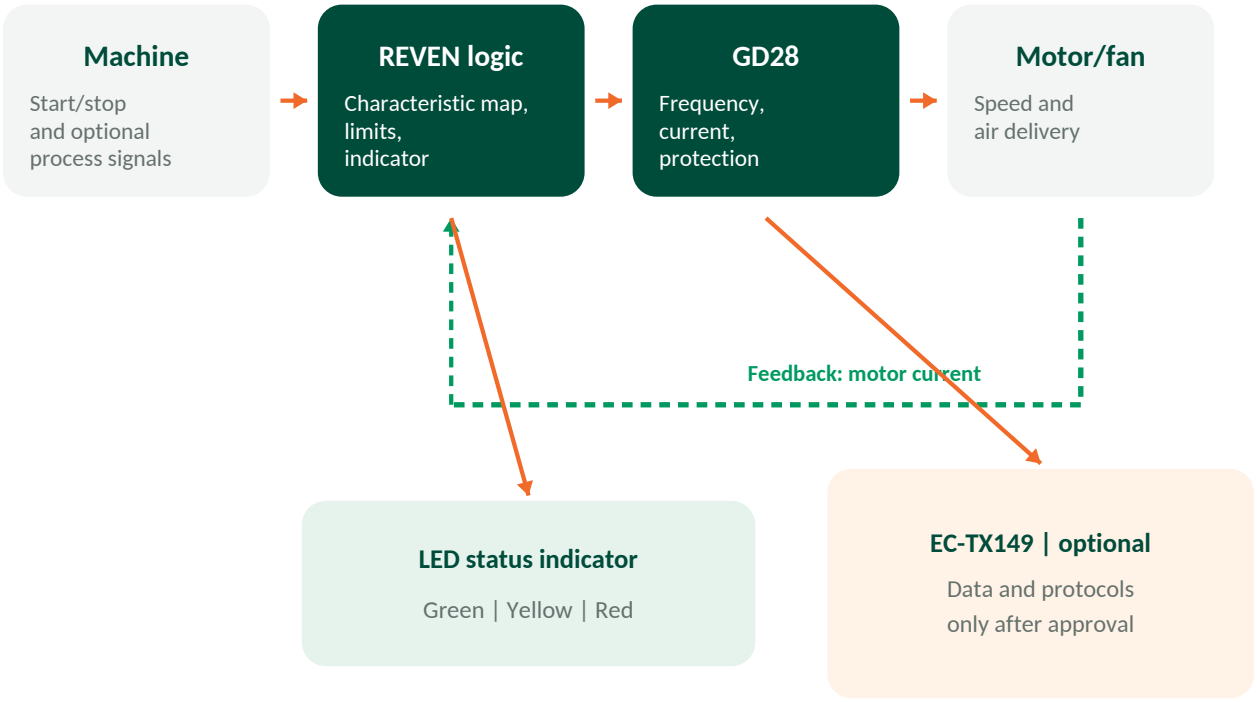
01	02	03	04	05
Motor and fan	**INVT GD28**	**REVEN data set**	**LED indicator**	**EC-TX149**
Generate the airflow.	Controls the motor and supplies operating values.	Characteristic map, limits and logic for each unit size.	Green, yellow and red as local status indications.	Optional Industrial Ethernet connection.

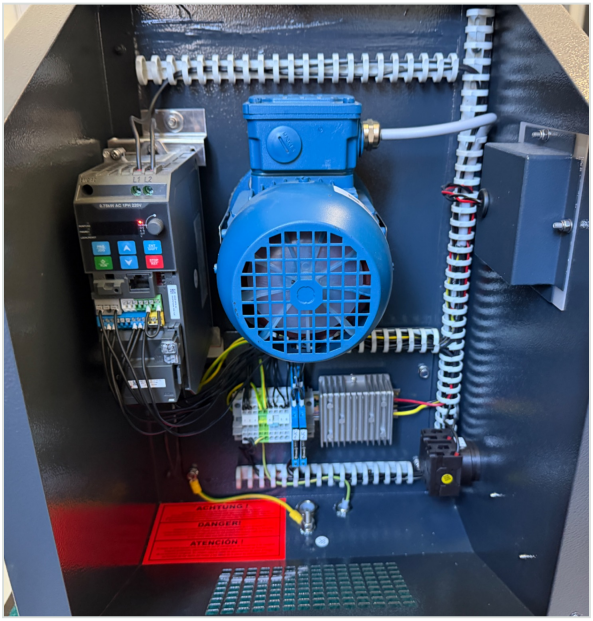
What is not included as standard

There are no separate air-velocity, temperature or differential-pressure sensors. Airflow is not shown directly on the unit. Any optionally connected sensors would be a separate project.

System architecture

Local functionality remains independent of an optional network connection. Motor current is the decisive feedback signal.





Three architectural principles

- Local XSC functionality is possible without a network.
- Unit-specific parameters instead of a universal standard set.
- Manufacturer data become application-specific only through the REVEN characteristic map and limits.

Measured, calculated, derived

Technical credibility depends on separating direct measured values from model-based conclusions.

Quantity	Acquisition	Meaning in the XSC context
Motor current	directly in the VFD	Primary feedback for the REVEN characteristic map
Output frequency	directly in the VFD	Control variable for motor speed and fan operation
Voltage / VFD status	directly in the VFD	Operating and diagnostic information
Speed, torque, power	VFD values	Without a separate XSC speed or torque sensor
Airflow	not direct	Derived from REVEN calibration and the current/frequency relationship
Filter condition	not direct	The effect of rising system resistance is detected
Temperature / differential pressure	not standard	No separate XSC process sensors according to the interview

Robust wording

XSC adjusts fan operation within a unit-specifically calibrated operating window. Airflow is not continuously measured by a separate volume-flow sensor.

Consequences for data sheets and sales

- Do not claim absolute proof of airflow.
- Do not quote process variables for which no sensor is present.
- Document internal VFD values and REVEN-derived conditions separately.

How the XSC logic works

From a clean initial condition to a service warning in six transparent steps.

1

Calibrate

REVEN assigns a verified characteristic map to each unit type and motor.

2

Start

In normal operation, the unit runs at a model-dependent output frequency.

3

Monitor

The variable frequency drive records motor current and operating frequency.

4

Adjust

If motor current falls as a result of higher resistance, frequency is increased step by step.

5

Warn

When frequency reaches a defined warning zone, yellow indicates that action will soon be required.

6

Limit

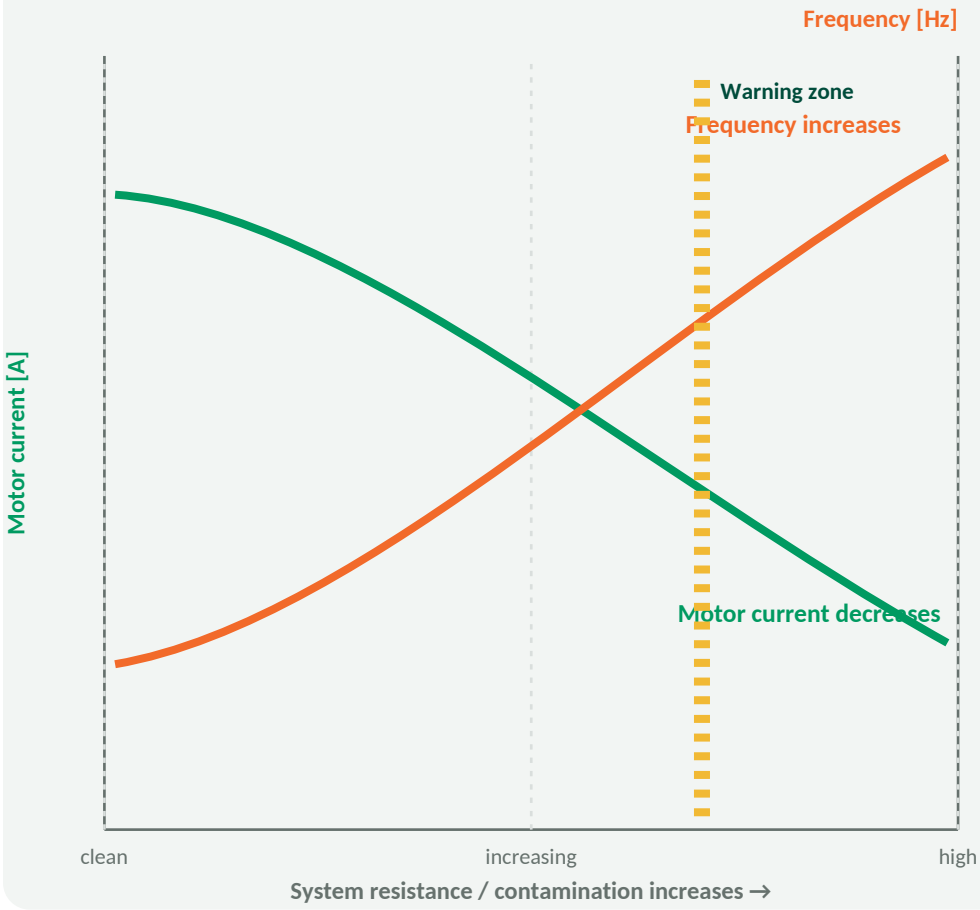
Above the approved limit, the drive is not accelerated indefinitely; faults result in red.

Technical classification

XSC is intelligent monitoring and control with unit-specific feedback via motor current. It is not a closed-loop airflow control system with a direct volume-flow sensor.

Why motor current decreases

With a fan, higher system resistance can reduce the motor load: less air is moved and current decreases.



Key point

More resistance does not automatically mean more current for a fan. If less air is moved, motor current can actually decrease.

XSC response

XSC increases frequency step by step—but only within the approved unit limits.

Why this logic must be unit-specific

- Motor, fan, separator and housing jointly determine the characteristic map.
- The relationship between current, frequency and air delivery is not the same for every unit size.
- Universal values or arbitrary parameter changes would invalidate the result.

Principle diagram: actual current and frequency values depend on the unit and operating point.

Calibration and installation limits

The XSC assessment is based on measurements taken on the unit—and remains dependent on the actual machine installation.

The REVEN data set is created in four steps

1. **Define unit type and motor**
2. **Measure current, frequency and airflow**
3. **Define operating window and thresholds**
4. **Save, transfer and protect the data set**

What changes the real installation

Make-up air	Can air flow freely into the machine enclosure?
Ducting	Length, cross-section and number of bends change the resistance.
Installation	Intake blockages and unsuitable connections affect the operating point.
Contamination	The separator and filters increase resistance over time.

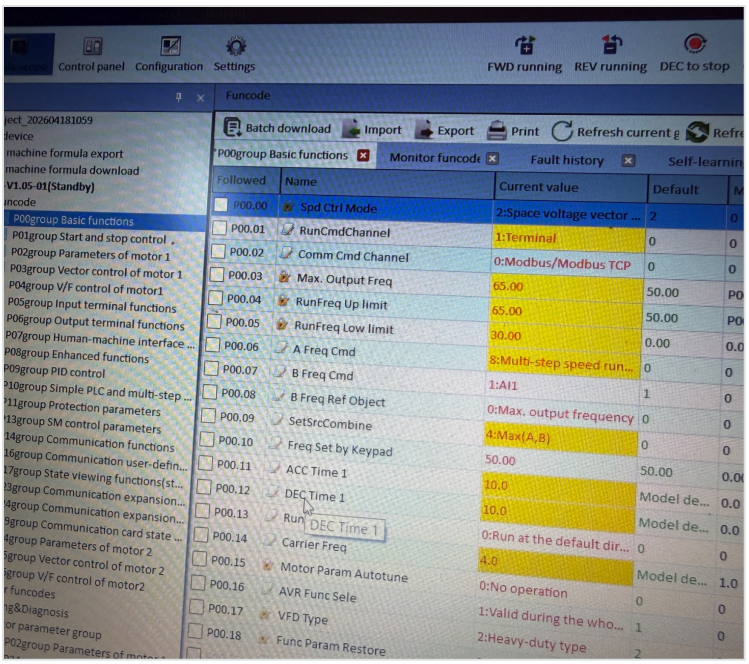
Practical example

A new unit showed yellow. After the machine enclosure was opened, the indicator changed to green. The cause was not the filter but insufficient make-up air. This example shows that XSC detects the effect of high resistance, not automatically its cause.

As a working basis, a maximum of approximately two metres of suction hose and a machine enclosure with good make-up air were specified. The exact installation limits must be confirmed for each unit type in the final installation documentation.

Performance reserve and frequencies

The reserve is deliberately limited: it compensates for rising resistance, but not for incorrect system design.



Pre-production parameter set on the test bench: 65 Hz upper limit, 30 Hz lower limit and 10 s ramps.

Code	Meaning	Pre-production example
P00.03	max. output frequency	65.00 Hz
P00.04	upper operating limit	65.00 Hz
P00.05	lower operating limit	30.00 Hz
P00.11	acceleration time	10.0 s
P00.12	deceleration time	10.0 s

No universal values

Normal output frequency depends on unit size, motor and the verified data set. Warning thresholds are also unit-specific. The values shown document the interview and test-bench status, not every subsequent production version.

Why not increase it indefinitely?

- Continuous operation at the upper limit places unnecessary load on the motor and system.
- An undersized unit or blocked make-up air is not corrected in this way.
- The maximum approved frequency is part of the protection and functional concept.

A clear traffic-light indicator

The new GD28 generation clearly distinguishes normal operation, service information and a technical fault.

GREEN

Operating condition within the calibrated range

Continue operation. No immediate action required.

YELLOW

Service will soon be required

Schedule cleaning and inspection of the filter, make-up air and ducting.

RED

Technical fault – unit stopped

Stop machining or follow the system logic. Have qualified personnel check the fault code.

Important change

In the previous XSC generation, red could indicate that filter cleaning was required while the fan continued to run. In the new target architecture, red is reserved exclusively for a technical fault; the unit then stops.

From signal to cause

XSC primarily detects the effect of a changed system. The exact cause is determined by visual inspection, installation data and VFD diagnostics.

Indicator	Possible cause	First check
Green	Normal operation within the characteristic map	No action; monitor the indicator
Yellow	Contaminated filter	Check separator and filter condition
Yellow	Make-up air blocked	Check machine enclosure and air inlet
Yellow	Ducting too long / too many bends	Check installation against the design
Red	VFD or motor fault	Read the fault code; involve qualified personnel

Diagnostic limit

XSC does not automatically distinguish between a contaminated filter, a blocked intake and an installation fault. The system detects their effect on motor current and frequency.

Connection to the machine

- Start/stop can be controlled via the designated terminals of the machine control system.
- Running and fault signals can be returned to the machine.
- A machine stop in the event of an XSC fault must be implemented for the specific project using relays and machine logic.

Yellow is not a last-minute alarm

The warning zone provides predictable lead time for cleaning and service. It is condition-based information—not a mathematical prediction of an exact maintenance date.

What XSC can—and cannot—do

Clear boundaries build trust. This keeps advice understandable, honest and technically sound.

XSC can

- Evaluate motor current and frequency during operation.
- Adjust frequency within approved limits.
- Indicate a normal, warning or fault condition.
- Make service requirements visible at an early stage.
- Optionally provide operating data via approved protocols.

XSC cannot

- Measure airflow directly or guarantee it in absolute terms.
- Uniquely identify every cause of high resistance.
- Correct an incorrect design by arbitrarily increasing speed.
- Predict an exact maintenance date without an external history.
- Connect to any supervisory system without a suitable interface.

Do not say

“XSC always maintains the same catalogue airflow under all installation conditions.” This statement contradicts the physical and installation limits explicitly stated in the interview.

Better wording

“XSC adjusts fan operation within a unit-specifically calibrated and limited operating window and makes service requirements visible.”

Energy and motor architecture

The benefits result from demand-based operation and robust separation of electrical components from the contaminated airflow.

Operating principle

- Operation below an unnecessarily high maximum frequency
- Soft starting
- Machine-side switch-off when not required

Standard motor + VFD

REVEN uses a separate motor and drive architecture. The motor remains outside the contaminated airflow, and speed can be adjusted via the VFD.

Comparison with an EC motor

The decisive factor is not a blanket rejection of EC technology, but the system architecture: no electronics in the contaminated air path and service-friendly components.

No blanket savings figure

Demand-based operation can reduce energy use compared with uncontrolled full-load operation. A specific saving is credible only with a comparison baseline, operating point, load profile and measurement.

The new INVT generation

GD28 is the successor platform for the target XSC architecture—with optional Industrial Ethernet communication.

Why the change?

- GD28 is intended to replace the manufacturer's previous GD20 generation.
- The optional EC-TX149 provides a platform for Industrial Ethernet protocols.
- Customers increasingly request operating data in PLC, SCADA or supervisory systems.
- The new platform facilitates standardised data sets and future service processes.

What remains—and what is new?

Unchanged	New / changed
Core XSC logic and unit-specific characteristic map	Optional network communication
Local operation without a network	Reduced power-supply architecture for the LED
Motor, fan and extraction performance for each unit	Red means a technical fault and standstill only
Green/yellow for operation and service information	Pre-production tests for protocols and data points

Previous — GD20

29 July 2026 — Pre-production GD28

Target — Early 2027

not binding

The protected REVEN parameter set

Motor, control and limit values are prepared and verified for each unit size and protected against unintended changes.

One data set per type

- Motor data
- Control logic
- Current thresholds
- Frequency limits
- Ramps and protection

Transfer

1 Laptop

INVT Workshop and approved project file

2 Transfer module

Pre-programmed data carrier for service transfer

3 Replacement VFD

Prepared at the factory for the unit type and serial number

Password protection P07.00

The GD28 supports user password protection. Once activated, a password is required to edit function codes. An unauthorised change can disable the XSC logic or prevent the VFD from starting.

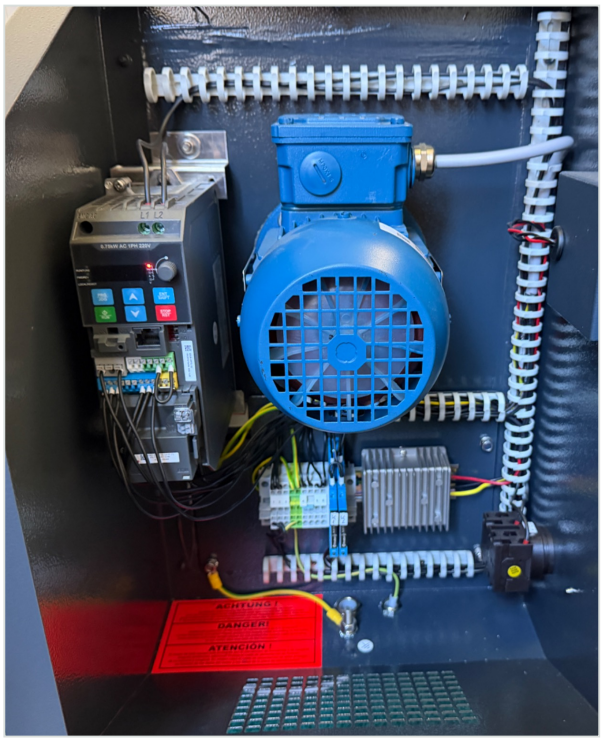
Parameter changes may be made only by REVEN or trained service partners and only on the basis of the approved data set.

Service and replacement

A defective variable frequency drive should be replaced one for one as a prepared unit by qualified personnel.

Service procedure

1. Report unit type and serial number
2. Obtain the correctly programmed replacement VFD
3. Isolate from power and remove correctly
4. Reproduce terminals and wiring one for one
5. Check function, direction of rotation, indicator and signals



Design improvement

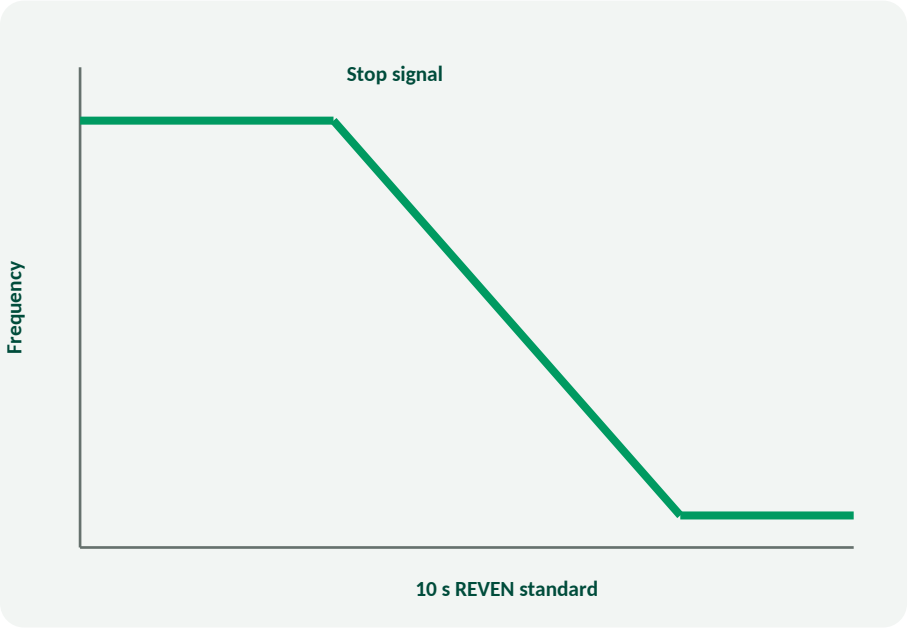
- The new VFD’s 24 V auxiliary supply can be used for the LED and converted to 12 V.
- The smaller power supply creates space and simplifies the auxiliary power supply.
- The main wiring remains essentially comparable; correct terminal assignment is mandatory.

Qualification

Work on the variable frequency drive, motor connection and control cabinet may be carried out only by appropriately qualified electricians after isolation, securing against reconnection and verification that no voltage is present.

Deceleration, start/stop & fire suppression

The 10-second deceleration ramp is part of the REVEN data set. Machine and fire-suppression logic remain project-specific safety responsibilities.



Why not shorter?

If deceleration is too aggressive, the fan can drive the motor regeneratively. The DC-link voltage rises, and the VFD may trip on overvoltage and fault.

Parameters

P00.12: deceleration time. Change only with REVEN approval.

Implement start/stop correctly

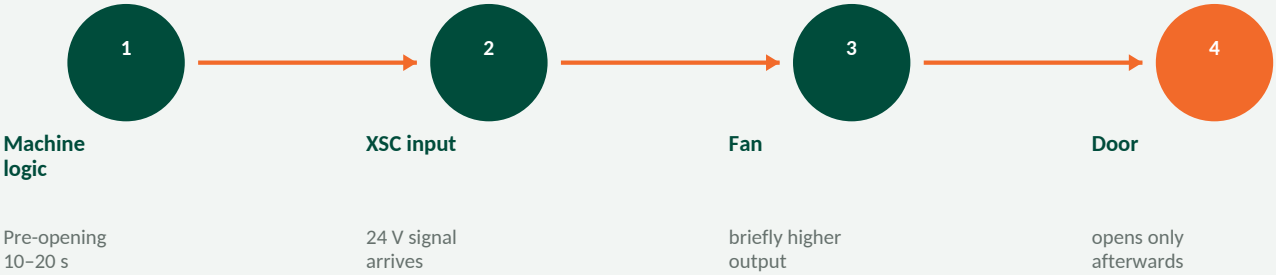
- Do not control the air cleaner during normal operation by rapidly disconnecting the mains supply.
- The variable frequency drive should remain powered; start/stop is controlled via the designated terminals.
- Repeated hard power cycling can cause faults and stress components.

Fire suppression system

When triggered, the machine or fire-suppression control system must provide the binding stop signal. REVEN provides the start/stop terminals. The safety function, response chain, CE assessment and risk analysis belong to the complete installation and must be coordinated for the specific project.

Door and process signals

XSC can respond to external signals. Pre-opening, timing logic and fail-safe behaviour must, however, be implemented in the machine control system.



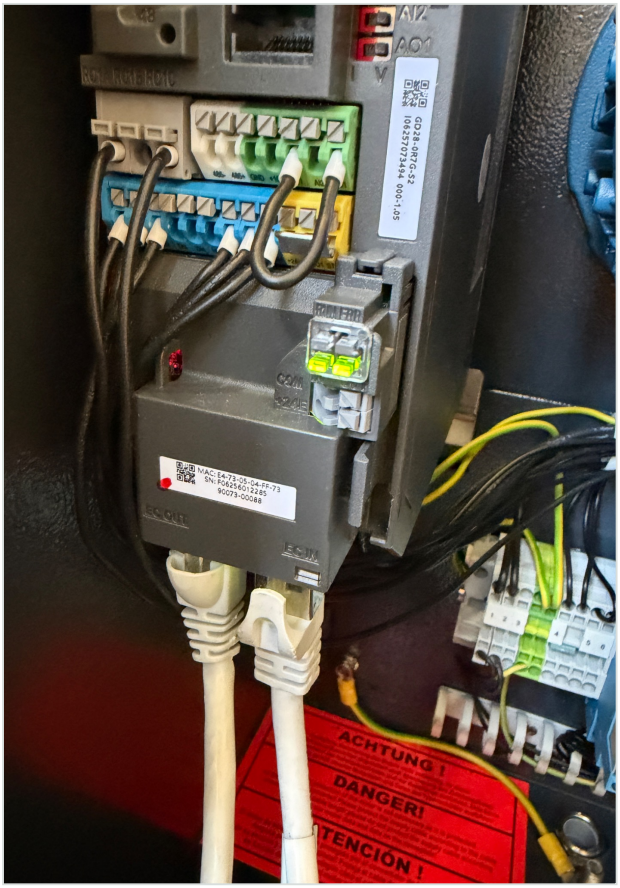
Practical function	Status on 29 July 2026	Responsibility
Defined deceleration ramp	REVEN standard data set	REVEN / service
Door signal for output changeover	Optional, customer-specific	Machine builder / integrator
Pre-opening before door release	customer-specific	Machine PLC
Additional process states	possible via start/stop	Operator / integrator
Fail-safe behaviour on signal fault	still project-specific	Overall system risk analysis

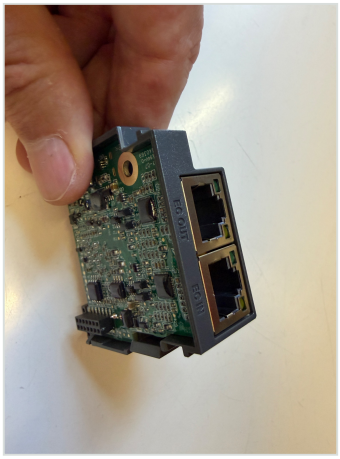
Limit of the XSC logic

XSC does not know by itself when a machine door will open. Without an external signal, there is no pre-opening. If the start signal fails in the wiring described, the unit does not start.

EC-TX149 as an optional expansion

The communication module expands the GD28 with Industrial Ethernet protocols and two RJ45 ports.





Manufacturer features

- Two RJ45 ports (EC IN and EC OUT)
- Up to 100 Mbit/s
- Line and star topology; ring depending on protocol
- Shielded Cat5e cable recommended
- Protocol selection via function code P24.00

REVEN classification

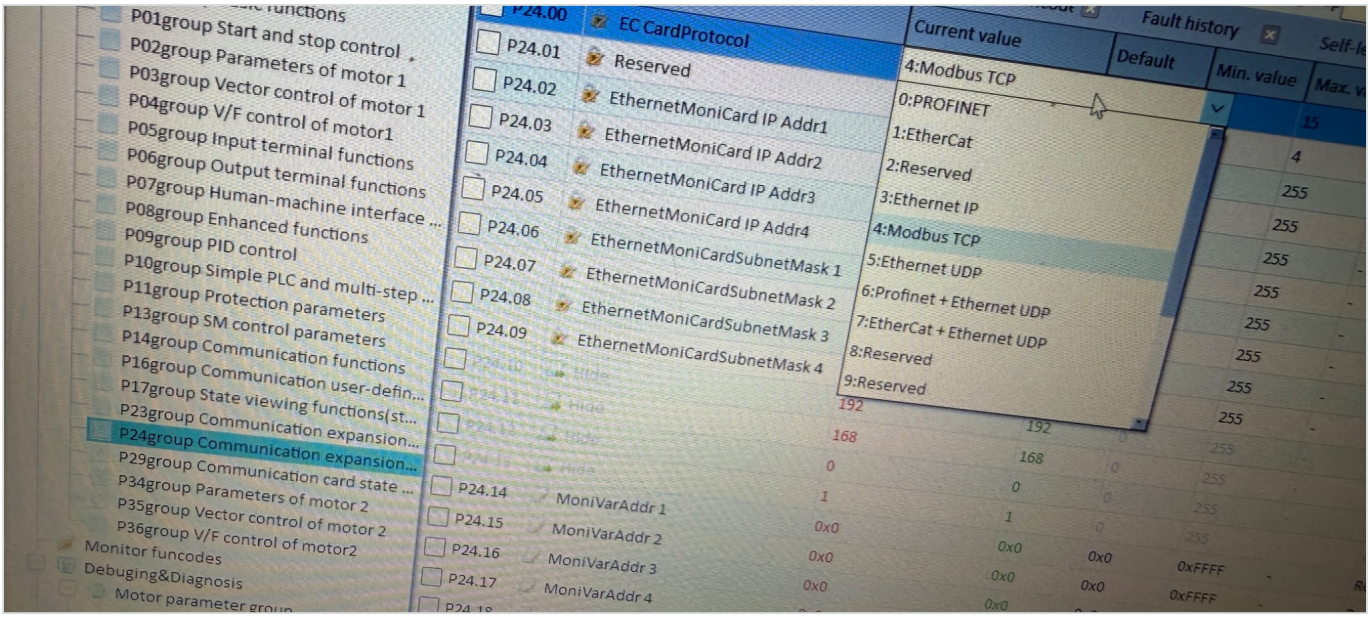
The EC-TX149 is optional. The GD28 and local XSC functionality operate without a network. As of the interview date, which protocols, data points and write permissions REVEN will release for series production is still part of pre-production testing.

Manufacturer function ≠ REVEN approval

The manual describes the card's full functional scope. For quotations, specifications and commissioning, only the configuration tested and documented by REVEN is relevant.

Protocols and selection via P24.00

The card supports several protocols. One mode is parameterised; there is no automatic detection.



INVT Workshop on the test bench: selecting the EC card protocol via P24.00.

P24.00	Manufacturer mode	Topology according to the manual
0	PROFINET	Line, star, ring (MRP)
1	EtherCAT	Line, star, ring
3	EtherNet/IP	Line, star, ring (DLR)
4	Modbus TCP	Line, star
5	EtherNet UDP / INVT Workshop	Line, star
6	PROFINET + EtherNet UDP	simultaneous
7	EtherCAT + EtherNet UDP	simultaneous; EtherCAT online
15	no communication card	-

Release status

PROFINET, Modbus and Ethernet connections were mentioned in the interview. The final REVEN protocol list, firmware specification and test documentation must be defined as binding before release for series production.

IP address and system integration

A dedicated IP address is possible when the optional module and an IP-based protocol are configured.

Manufacturer factory settings

Industrial Ethernet IP: 192.168.0.20
Subnet: 255.255.255.0
Modbus TCP station: 1

These values are not a recommendation for the production network.

Engineering

IP address, device name, station, subnet and protocol must match the customer architecture. The higher-level control system must explicitly support the selected protocol.

Not only building management systems

- Targets may include a PLC, machine control system, SCADA, production control system or BMS.
- The physical RJ45 connection alone does not establish compatible communication.
- Protocol, data model and boundary of responsibility must be clarified before the project starts.

Data points and history

The GD28 provides many internal values. Which of these are approved as XSC data points is a separate REVEN decision.

Code	GD28 value	Classification
P17.00	Set frequency	VFD monitor value
P17.01	Output frequency	Core value for XSC
P17.03	Output voltage	Diagnostic value
P17.04	RMS output current	Core value for XSC
P17.05	Motor speed	VFD value, no separate sensor
P17.08	Motor power	relative to rated power
P17.09	Output torque	VFD value
P17.11	DC-link voltage	Diagnostic value

Planned customer-relevant scope

- Operating status, frequency, speed and motor current
- Warnings, faults and fault codes
- Additional values only after benefit review, testing and documentation

Live data and history

Current values can be read cyclically. The VFD has a fault history. A continuous time series with timestamps and long-term storage must be implemented in a higher-level customer control or supervisory system.

Still open

The final REVEN data-point list must include data type, scaling, unit, update rate and read/write permission.

Communication faults and restart

Fault behaviour is not a secondary issue: it determines whether the air cleaner continues to run, stops or changes to a safe state.

1

Without a network

XSC can be operated locally. Start/stop is controlled via terminals; the EC-TX149 is not required.

2

Network loss

The final interview answer specifies a fault and stop. The exact behaviour depends on the protocol and timeout and must be validated before series production.

3

Power failure

Restart depends on the start signal, wiring and restart concept. An automatic restart must not be assumed as a general rule.

4

Module replacement

The IP address, protocol parameters and device name may need to be reassigned or checked.

Manufacturer timeouts

The EC-TX149 manual specifies configurable communication timeouts for each protocol; several default values are 5 s. The final REVEN data set must clearly document the timeout, response and acknowledgement.

Release requirement

Before publication, reproducible tests are required for cable breakage, switch failure, restart and module replacement.

Cybersecurity and responsibility

Display password protection safeguards parameters on the unit—but not automatically network communication.

Minimum principles for optional connectivity

1. **Segment** — Integrate XSC into a controlled machine or OT network.
2. **Minimise** — Enable only the protocols, data points and write permissions that are required.
3. **Secure** — Use a firewall, VLAN, ACL and access via authorised engineering stations.
4. **Document** — Maintain traceable records of IP addresses, firmware, parameters, backups and changes.
5. **Test** — Test network failure, restart and unauthorised write attempts.

Especially important with Modbus

The interview established that display password protection does not block network access and that parameter changes are possible in principle via Modbus. A production network must therefore not be treated as a read-only interface until permissions and protective measures have been verified.

REVEN

Defines approved protocols, data points, parameters, firmware and functional behaviour.

Customer integration

The machine builder, automation provider or operator is responsible for network architecture, access rules and overall security.

Series, option, test, customer-specific

A clear overview of core functionality, optional equipment and ongoing pre-production tests—status as of 29 July 2026.

Function	Status	Classification
Local traffic-light indicator	Core XSC function	New meaning of red still at pre-production stage
Autonomous operation without a network	intended	EC-TX149 not required
New GD28 generation	Pre-production	Series-production target early 2027, not binding
EC-TX149	Option / test	Only when connectivity is required
Reading operating data	Option / test	Final data-point list still open
Writing network commands	not approved	Permissions and security concept still open
Historical time series	external	VFD with fault history only
10 s deceleration ramp	REVEN standard	Protected data set
Door contact / pre-opening	customer-specific	Signal and timing logic on the machine side
Process signals	customer-specific	via start/stop or defined inputs
Retrofitting existing XSC units	case-by-case	usually extensive electronics conversion

Release gates before market launch

1. Complete unit and field tests. 2. Confirm CE/EMC and the overall risk assessment. 3. Freeze the protocol and firmware list. 4. Document data points with read/write permissions. 5. Test fault and restart behaviour. 6. Approve service and commissioning documentation.

Critical questions – Part 1

Concise, robust answers to the technical objections raised in the XXL guide.

What has REVEN made intelligent?

Not VFD data access alone, but the characteristic map, limits and parameterisation for each XSC unit size.

Is XSC a control system?

Intelligent monitoring and control with current feedback—not direct airflow control.

How does XSC determine airflow?

From calibration measurements of current, frequency and actual air delivery—not from a permanent airflow sensor.

Is yellow predictive maintenance?

No. Yellow is condition-based service information. A prediction requires historical time series.

Why not use a simple differential-pressure switch?

Hoses can become contaminated; differential pressure fluctuates and would require additional fine-grained evaluation.

Why use a standard motor with a VFD?

Robust separation from the contaminated airflow, flexible parameterisation and service-friendly components.

Is separation more important than the motor type?

The overall architecture is decisive; there are no electronics in the contaminated air path.

Where can energy be saved?

Through lower frequencies, soft starting and operation only when required—without a blanket percentage claim.

Critical questions – Part 2

What customers need to know about networking, the manufacturer, retrofitting and the limits of sales claims.

Why do I need XSC for an old on/off unit?

Greater transparency of operating condition, more predictable maintenance, demand-based operation and optional data connectivity.

What if the customer does not want a network?

The module is omitted. Local XSC operation works without a network.

How do we address cybersecurity?

Segment the optional network, minimise access, verify write permissions and provide no direct Internet connection.

What do we say about the Chinese manufacturer?

INVT supplies the platform. Approval is established through REVEN testing, the data set and documented integration.

Can the new generation operate without a network?

Yes. Networking is optional, not a prerequisite for local functionality.

Can existing XSC units be retrofitted?

Only after case-by-case assessment; the VFD, electronics and wiring would usually require extensive modification.

What can the new generation not yet do?

Final approved documentation for protocols, data points, permissions and fault behaviour is still in progress.

Which claim is off limits?

Constant catalogue airflow regardless of installation and condition, or arbitrary additional output above 65 Hz.

Three key messages for sales and consulting

This is how XSC technology can be explained simply, convincingly and correctly.

1

XSC makes it visible whether the air cleaner is operating within its calibrated operating window.

2

REVEN logic uses motor current and frequency, adjusts the fan within defined limits and indicates upcoming service requirements in yellow.

3

The GD28 generation provides the platform for optional Industrial Ethernet communication—following documented approval.

Overstated	Robust
XSC always keeps airflow constant.	XSC adjusts fan operation within defined limits.
XSC is predictive maintenance.	XSC provides condition-based service information.
Every unit connects to any BMS.	Optional integration into compatible systems via approved protocols.
XSC saves X per cent energy.	Demand-based operation can reduce energy use.
All VFD data are available.	Only documented and verified data points are supported.

Closing statement

A green light is not enough. What matters is an operating condition that is visible, interpretable and monitored within clear limits.

Initial commissioning checklist

The following points provide a robust working structure; the unit-specific installation and operating instructions remain binding.

Mechanical system and air path

- [ ] Unit type and design confirmed
- [ ] Separator and filters installed cleanly
- [ ] Make-up air can enter the machine
- [ ] Duct length, cross-section and bends checked

Electrical system and parameters

- [ ] Mains supply, protective conductor and motor data checked
- [ ] Correct REVEN data set loaded
- [ ] Frequency limits and 10 s ramp confirmed
- [ ] Display password protection activated

Signals and function

- [ ] Start/stop via the designated input
- [ ] Running and fault signals tested
- [ ] Green, yellow and red functionally tested
- [ ] No hard mains switching during normal operation

Optional communication

- [ ] Protocol P24.00 specified
- [ ] IP address, name, station and subnet documented
- [ ] Read/write permissions and data points approved
- [ ] Cable break, timeout and restart tested

Documentation / project: _____

Date / inspector: _____

Approval: _____

Quick diagnosis during operation

From the visible symptom to the next safe diagnostic step.

Observation	Possible cause	Check / action
Yellow on a new unit	insufficient make-up air, ducting	Check machine and installation against the design
Yellow after a period of operation	Filter or separator contaminated	Clean in accordance with the operating instructions
Yellow remains after cleaning	Installation, ducting, incorrect data set	Have installation and parameters checked by service personnel
Red / standstill	VFD, motor or supply fault	Record fault code; involve qualified personnel
Fault during start/stop	hard mains switching, signal sequence	Check supply and control input
No network data	Protocol, IP address, cable, timeout	Check P24.00, addressing and link
No connection after module replacement	IP address/name lost or different	Reassign network parameters
Air performance implausible	incorrect design or high resistance	Reassess air path and unit selection

Before replacement

Document unit type, serial number, VFD type, fault code, indicator status and installation situation. Photos of terminals and wiring make unambiguous assignment easier.

Safety boundary

Do not change parameters, work on live equipment or reset recurring faults without identifying the cause.

How the XSC Guide was created

Expertise from development, service and test operation meets manufacturer documentation and 80 specific practical questions.

Source	Scope / status	Contribution to the guide
Technical interview	1:47:37 | 29 July 2026	Answers, status and practical examples
REVEN XSC question guide	15 pages | 28 July 2026	80 questions for consulting and service
RSC Control Guide	8 pages | 2023	Design reference
INVT GD28 Manual EN V1.3	410 pages | 03/2026	Parameters, monitoring, protection
INVT EC-TX149 Manual V1.0	166 pages | 06/2025	Protocols, IP addressing, topologies
Practical photos	11 photographs | 29 July 2026	Pre-production, parameterisation, module

Four quality levels for clear statements

A **Practical experience** — What was observed and reproducibly confirmed during test operation?

B **Technical basis** — Which functions does the INVT hardware provide in principle?

C **REVEN status** — What is series standard, optional, under test or customer-specific integration?

Note for sales partners

For quotations and projects, the approved series-production scope, the current REVEN data set and the applicable technical documentation always apply.

80 practical questions – Part 1

Concise answers for consulting, engineering and service.

ID	Question	Robust key statement
1	What does a green lamp on a simple separator prove?	Often only that voltage is present or the unit is running—not airflow, filter condition or effective capture.
2	Can the unit be audibly running and still extract too little?	Yes. Contaminated filters or high resistance can greatly reduce airflow.
3	What are the consequences of unnoticed performance loss?	Exposure, contamination of the production hall, stress on machinery/electronics and reduced process reliability.
4	Why was XSC developed?	To make operating condition visible, make maintenance more predictable and enable demand-based operation.
5	What does XSC mean and what does it include?	X-CYCLONE® Speed Control: motor/fan, VFD, REVEN data set, LED and optional EC-TX149.
6	How do you explain XSC to an operator?	It detects operating changes, adjusts output within defined limits and warns when service is required.
7	How do you explain XSC to an automation engineer?	Motor-current feedback plus a model-specific characteristic map controls frequency and the status indicator.
8	Which components belong to the technology?	GD28, REVEN logic, motor/fan and LED; no separate process sensors; communication optional.

80 practical questions – Part 2

Concise answers for consulting, engineering and service.

ID	Question	Robust key statement
9	Standard VFD or REVEN development?	Motor control and data are standard VFD functions; the characteristic map, thresholds and unit tuning are REVEN developments.
10	Which values are recorded?	Core values are current and frequency; additional VFD values are possible. No temperature, differential-pressure or airflow sensors are included as standard.
11	What is measured directly and what is derived?	Current/VFD values are direct; airflow and filter condition are derived from calibration and system effects.
12	Does XSC control frequency or airflow?	Motor frequency is adjusted; air delivery changes indirectly. There is no direct airflow control.
13	Which feedback signal does the logic use?	Motor current in conjunction with unit-specific frequency/airflow calibration.
14	What is the complete sequence?	Record current -> evaluate characteristic map -> adjust frequency -> fan delivers airflow -> output LED status.
15	What happens as contamination increases?	Motor current decreases, frequency rises step by step, the warning zone is reached and service is indicated.
16	How large is the performance reserve?	It depends on the unit size; there is no general percentage. The reserve lies within the approved frequency window.

80 practical questions – Part 3

Concise answers for consulting, engineering and service.

ID	Question	Robust key statement
17	Which frequencies apply?	Interview: 30 Hz minimum, 65 Hz maximum; normal values depend on type, for example 32–33 or 40–45 Hz.
18	Why not run at an arbitrarily higher frequency?	Motor and system protection; incorrect design must not be concealed by continuous operation at the limit.
19	What if airflow is still too low at 65 Hz?	Clean the filter and check make-up air, ducting, installation and unit selection.
20	What exactly does green mean?	Operation within the calibrated range—but not direct, absolute proof of airflow.
21	What does yellow mean?	Warning zone: schedule service/cleaning and check possible causes of resistance.
22	What does red mean?	Technical fault; the unit is stopped. Determine the cause using the VFD fault code and professional diagnostics.
23	What should the operator do?	Green: continue working. Yellow: schedule service. Red: secure the process and call qualified personnel.
24	Does XSC identify the exact cause?	No. It primarily detects the effect; the filter, make-up air and installation must be checked separately.

80 practical questions – Part 4

Concise answers for consulting, engineering and service.

ID	Question	Robust key statement
25	Is the service indicator predictive maintenance?	No. It is condition-based. A genuine prediction requires stored trends and a predictive model.
26	Why change to GD28?	A successor platform, optional Industrial Ethernet and a foundation for future services.
27	Which customer problem does GD28 address more effectively?	Operating data can optionally be integrated into compatible PLC, SCADA or supervisory systems.
28	What remains unchanged?	Core XSC logic, local operation, motor/fan and the green/yellow indicator concept.
29	What is new?	The EC-TX149 option, the new meaning of red and a smaller auxiliary power supply for the LED.
30	What is intended to be standard equipment?	Target: VFD, REVEN data set and LED. Communication remains optional; the complete system was at the pre-production stage on 29 July 2026.
31	What is possible only with EC-TX149?	Industrial Ethernet communication and reading/transmitting approved operating data.
32	What is still being tested?	The complete GD28 implementation, protocol compatibility, data points, fault behaviour and customer requirements.

80 practical questions – Part 5

Concise answers for consulting, engineering and service.

ID	Question	Robust key statement
33	230 V or 400 V?	230 V single-phase for small demonstration/special units; typically three-phase in industrial applications. Final selection is unit-specific.
34	How is the parameter set protected?	Load it via laptop/transfer module, verify it for each type and use P07.00 to protect it against local changes.
35	How is a defective VFD replaced?	By qualified personnel using a correctly pre-programmed replacement VFD and a documented one-for-one replacement.
36	Who may transfer parameters?	REVEN or a trained service partner using approved software/file or a transfer module.
37	What wiring improvement is provided?	A network option and smaller LED supply; the main wiring remains essentially comparable.
38	Which pre-production tests are necessary?	Practical operation, protocol compatibility, data requirements, failure behaviour and reproducible unit configuration.
39	When is release for series production planned?	Target early 2027, stated as Q1/Q2 in the interview; expressly not binding.
40	Can every unit be assigned an IP address?	With the optional EC-TX149 and a suitable IP protocol: yes, following project engineering.

80 practical questions – Part 6

Concise answers for consulting, engineering and service.

ID	Question	Robust key statement
41	Which communication modes does this apply to?	The card's IP-based Industrial Ethernet modes.
42	Which protocols does the combination support?	Manufacturer: PROFINET, EtherCAT, EtherNet/IP, Modbus TCP and EtherNet UDP; the REVEN list is still to be approved.
43	Are all protocols active at the same time?	No. P24.00 selects the mode; combinations 6 and 7 additionally permit UDP monitoring.
44	Can it connect to any BMS?	No. The target system must support the protocol and data model or use a suitable gateway.
45	Is BMS the right term?	Depending on the project: PLC, machine control system, SCADA, production system or BMS.
46	Which data should the customer read?	Target: status, frequency, speed, current, warning and fault; the final list is still open.
47	Which data points does REVEN officially support?	Only those in the list published after testing, including type, unit, scaling and permission.
48	Live data or history?	Live data plus VFD fault history; no complete long-term time series in XSC.

80 practical questions – Part 7

Concise answers for consulting, engineering and service.

ID	Question	Robust key statement
49	Where are long-term trends stored?	In a higher-level customer control system, database or supervisory system.
50	Which network commands are permitted?	Discussed in the interview but not yet approved. Terminal start/stop remains the clear standard.
51	Which commands are blocked?	The local display can be locked; network access requires separate permission and security restrictions.
52	What happens if the network is lost?	Final interview answer: fault and stop; this must be validated before series production depending on protocol and timeout.
53	What happens after a power failure or module replacement?	Restart depends on the start logic; after module replacement, check or reassign IP address/name/protocol.
54	How are unauthorised changes prevented?	P07.00 provides local protection. Network segmentation, ACLs and change processes protect communication.
55	Who is responsible for integration?	Depending on the project: machine builder, electrician, automation provider or operator; REVEN supplies the interface specifications.
S1	Is a defined deceleration ramp possible?	Yes. The interview specifies 10 s from stop signal to standstill as the REVEN standard.

80 practical questions – Part 8

Concise answers for consulting, engineering and service.

ID	Question	Robust key statement
S2	Which deceleration parameters are protected?	P00.12 and the associated data-set values. Ramps that are too short can cause regenerative overvoltage.
S3	How should it be coordinated with the fire suppression system?	The machine/fire-suppression logic must provide the stop signal; the overall response must be assessed for safety in the specific project.
S4	Can XSC respond to a door signal?	Yes. External signals can trigger an output changeover.
S5	Is pre-opening possible?	Only if the machine PLC provides a signal 10–20 s in advance; XSC responds to the input.
S6	What applies if the signal fails?	In the circuit described, XSC does not start without a start signal; fail-safe behaviour must be defined for the complete installation.
S7	What is the status of the door logic?	Optional, customer-specific integration—not a general series-production function of the machine logic.
S8	Are additional process states possible?	Yes, provided the operator translates them into start/stop or defined input signals.
S9	Internal characteristic map or external signals?	Normal operation uses the XSC characteristic map; external door/process signals are an optional addition.

80 practical questions – Part 9

Concise answers for consulting, engineering and service.

ID	Question	Robust key statement
S10	Who defines frequencies and ramps?	REVEN, for each unit type; safe transitions require correct design and coordinated machine logic.
T1	What is intelligent if the VFD supplies the data?	The REVEN evaluation, calibration and unit-specific logic—not the mere availability of data.
T2	Control or monitoring?	Intelligent monitoring and control; no direct closed-loop airflow control.
T3	What is the airflow assessment based on?	A measurement data set containing current, frequency and actual measured air delivery for each unit type.
T4	Is yellow predictive maintenance?	No. Yellow is condition-based service information with predictable lead time.
T5	Why not differential pressure?	Additional sensors/hoses can become contaminated; the signal fluctuates and is difficult to evaluate precisely.
T6	Why not an EC motor?	Separate electronics, a robust air path and VFD flexibility are decisive—not a blanket rejection of EC technology.
T7	Motor or separation as the main advantage?	The system architecture is what matters; separation from the contaminated airflow is a key advantage.

80 practical questions – Part 10

Concise answers for consulting, engineering and service.

ID	Question	Robust key statement
T8	Where can savings arise despite the VFD?	Potentially through lower frequency, soft starting and demand-based operation; measure for the specific project.
T9	Why XSC after 15 years of on/off operation?	Greater condition transparency, more predictable maintenance, optional data and demand-based operation.
T10	What if a networked device is rejected?	Omit the EC-TX149; full local XSC functionality remains possible.
T11	Cybersecurity and manufacturer origin?	Address security through the architecture. REVEN tests and integrates; origin does not replace a technical assessment.
T12	Operation without a network?	Yes. The communication module is optional.
T13	Retrofit existing XSC units?	Usually complex because the VFD, circuit board and wiring are affected; only after case-by-case assessment.
T14	What can the new generation not yet do?	Final series-production approval, the data-point list and documentation of permissions and fault behaviour are still open.
T15	Which claim must sales never make?	Constant airflow regardless of installation, or arbitrary performance increases beyond the approved limits.

Quick parameter reference

Selected manufacturer parameters with direct relevance to the XSC Guide. The complete manuals remain authoritative.

GD28	Meaning
P00.01	Run command: keypad, terminal or communication
P00.02	Communication channel for run commands
P00.03	Maximum output frequency
P00.04	upper operating limit
P00.05	lower operating limit
P00.11	Acceleration time 1
P00.12	Deceleration time 1
P07.00	User password
P17.00	Set frequency
P17.01	Output frequency
P17.04	RMS output current
P17.05	Motor speed
P17.08	Motor power
P17.09	Output torque
P17.11	DC-link voltage

EC-TX149	Meaning
P24.00	Protocol selection
P24.02-.05	Monitoring IP, default 192.168.0.1
P24.06-.09	Monitoring subnet, default 255.255.255.0
P24.27	General communication timeout
P24.30	EtherCAT-Timeout
P24.31	PROFINET-Timeout
P24.32	EtherNet/IP-Timeout
P24.34	Modbus-TCP-Timeout
P24.37-.40	Industrial Ethernet IP, default 192.168.0.20
P24.41-.44	Industrial Ethernet subnet, default 255.255.255.0

Rule for service

Parameter values must not be derived from this overview. The only authoritative source is the approved REVEN data set matching the unit type and motor, including its version status and test report.

Terms, contact and validity

A concise conclusion for engineering, sales and service.

Term	Meaning in this guide
XSC	X-CYCLONE® Speed Control
VFD	Variable frequency drive
Characteristic map	Unit-specific relationship between current, frequency and air delivery
Direct measured value	Value recorded directly in the VFD or by a sensor
Derived condition	Interpretation based on measured values and REVEN calibration
Service information	Condition-based warning without an exact predicted date
Industrial Ethernet	Ethernet-based protocols for automation networks
Pre-production	Technically advanced stage before general release for series production

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Validity

Version 1.2 reflects the technical interview and pre-production status as of 29 July 2026. For quotations, specifications and commissioning, the approved series-production scope and current technical documentation apply.

Subject to technical changes and errors.

GREEN LIGHT IS NOT ENOUGH.