

intreXis[®]

Power Supplies with the 



Datasheet

intreXis Boardnet Converter Platform IC37X, 100 W Single-Output 24 Vin – 110 Vin

-  **Extra high efficiency: > 94 % @ 110 Vin, 100 W**
-  **Extra wide input voltage range: 14.4 – 154 VDC**
-  **Extra wide temperature range: -50 – 85 °C**
-  **Extra small and light: 210 g**
-  **Extra flat: 31 mm total mounting height**

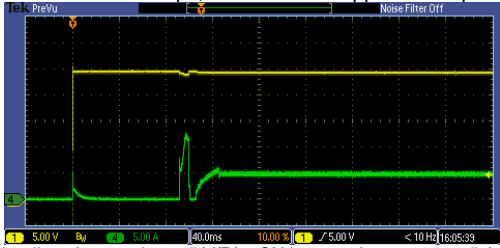
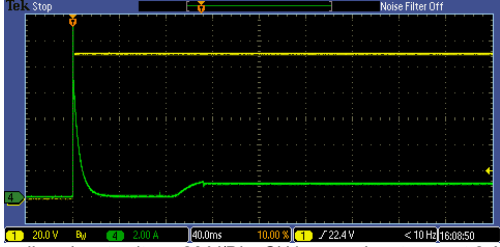
This datasheet covers the details of the IC37X power supplies with single output voltage and output power of 100 W. These DC/DC converters are designed according to EN 50155:2021 and IEC 60571:2012 for railway applications and are ideal for other demanding environments which require the highest performance and reliability.

Output voltages: 12 V, 24 V. Other voltages on request.

Ordering codes: IC371_2, IC373_2

The differences between the variants are explained in this datasheet.

INPUT CHARACTERISTICS

Continuous Input Voltage Range	16.8 – 137.5 VDC
Temporary Input Voltage Range according to EN 50155:2021, 5.2.3	14.4 – 154 VDC for 1.0 sec
Input Undervoltage Lockout	Vin_OFF = 13.2 VDC $\pm$ 2 % Vin_ON = 15.5 VDC $\pm$ 2 %
Input Voltage Reverse Polarity Protection	Active reverse polarity protection: lin_reverse < 500 μ A @ Vin = -154 VDC (with reverse polarity of Vin, the converter remains off without being damaged. Only a small reverse current lin_reverse flows. With correct polarity of Vin, the converter works correctly)
Inrush Current over the entire operating temperature range	An active inrush limitation circuit limits the input inrush current at switch-on of the input voltage with a 10 Ω-resistor. The second peak 100 ms after switch-on is caused by the first converter-stage. (The charging current into EMI suppression capacitors is disregarded in the first microseconds after switch-on) Inrush Current @ 24 Vin, full load Switch-on: 2.4 Apk, after 100 ms: approx. 12 Apk  CH1 yellow: Input voltage 5 V/Div, CH4 green: Input current 5 A/Div, Timebase: 40 ms/Div Inrush Current @ 110 Vin, full load Switch-on: 11 Apk, after 100 ms: approx. 1.2 Apk  CH1 yellow: Input voltage 20 V/Div, CH4 green: Input current 2 A/Div, Timebase: 40 ms/Div Inrush Current Integral: $I_{inrush}^2 t < 1.5 \text{ A}^2\text{s} @ \text{Vin} = 16.8 - 137.5 \text{ VDC}$

Input Capacitance	560 μ F			
Input Current typ. @ full Load	24 Vin	36 Vin	72 Vin	110 Vin
	4.7 A	3.1 A	1.5 A	0.98 A
Input Power typ. @ no Load over the input voltage range	0.67 – 0.99 W			
Internal Input Fuse	Fuse included, therefore no external fuse or circuit breaker required. If you, nevertheless, install an external circuit breaker for any other reason, please select it according to the recommendation below. $I^2t_{\text{fuse}} = 268 \text{ A}^2\text{s}$			
External Circuit Breaker recommendation Important: Circuit Breaker must be rated for the maximum DC-input voltage	24 Vin	36 Vin	72 Vin	110 Vin
	10 A, type B	6 A, type B	3 A, type B	2 A, type B
Interruptions of Input Voltage Supply (Hold-up time)	Class S2 (10 ms) according to EN 50155:2021 The converter continues to operate as intended during and after the interruption, with no degradation of performance or loss of function over the entire input voltage range (Performance criterion A).			
Startup time (Time input voltage ON to output voltage ON)	< 200 ms for all input voltages			

OUTPUT CHARACTERISTICS

Output Voltage Nominal	IC371_2	IC373_2
	12.0 VDC	24.0 VDC
Max. Continuous Output Power @ $V_{in} = 16.8\text{--}137.5\text{ V}$, $14.4\text{--}154\text{ V}$ for 1.0 sec (no derating over the entire temperature range)	100 W	
Minimum Load	No minimum load required.	
Setpoint Accuracy	< 1.0 %	
Load Regulation @ off-load to full load over the entire temperature range	< 0.2 %	
Line Regulation @ full load over the entire temperature range	< 0.1 %	
Output Ripple & Noise @ 20 MHz bandwidth, including spikes	< 50 mVpp @ -25 – +85 °C < 100 mVpp @ -50 – -25 °C	
Overload and Short-Circuit	The converter is continuous overload and short-circuit proof. Output overloaded: The output voltage is reduced and the output current limited (constant current). Output short-circuited: Constant current.	
Current Limit (varies due to component tolerances)	IC371_2	IC373_2
	8.7 – 10.4 A	4.3 – 5.2 A
Short-Circuit current	IC371_2	IC373_2
	< 10.5 A	< 5.5 A
Overvoltage Protection (OVP) (output voltage is limited, if main regulation loop fails)	IC371_2	IC373_2
	< 16 VDC	< 31 VDC
Paralleling of Outputs	Paralleling can be optionally included. Please contact intreXis for advice	
Active Decoupling Diode for redundant Systems	Decoupling diode on the output for redundant systems with two or more power supply sources driving a load can be optionally included. Please contact intreXis for advice	
Maximum load-capacitance	Unlimited, tested up to 30 mF	

EFFICIENCY

IC371_2:

Conditions	24 Vin	36 Vin	72 Vin	110 Vin
Efficiency typ. @ 100 % Load	89.0 %	89.9 %	91.0 %	92.5 %
Efficiency typ. @ 66 % Load	88.8 %	89.7 %	91.1 %	93.0 %
Efficiency typ. @ 33 % Load	86.4 %	87.1 %	89.0 %	92.2 %

IC373_2:

Conditions	24 Vin	36 Vin	72 Vin	110 Vin
Efficiency typ. @ 100 % Load	90.6 %	91.4 %	92.8 %	94.3 %
Efficiency typ. @ 66 % Load	89.0 %	90.0 %	91.5 %	93.2 %
Efficiency typ. @ 33 % Load	85.8 %	86.6 %	89.0 %	91.1 %

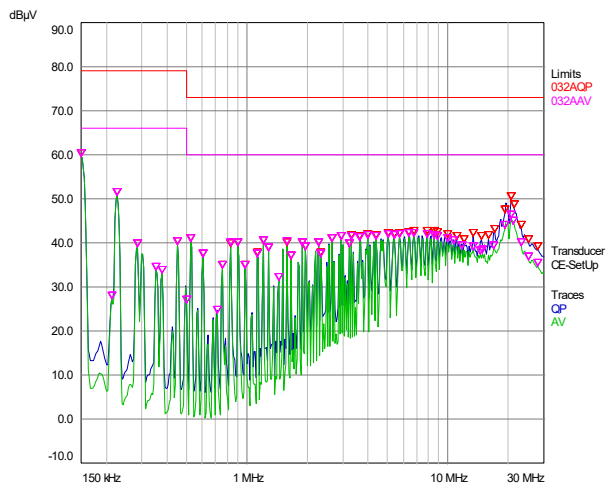
SIGNALS AND INTERFACES

DC-OK Signal	Optically isolated solid-state relay (between connector X20/pin 4-5, see block diagram)	
DC-OK relay & LED switch on threshold	IC371_2	IC373_2
	Vout > +10.9 VDC $\pm 2\%$	Vout > +22.0 VDC $\pm 2\%$
DC-OK relay & LED switch off threshold	IC371_2	IC373_2
	Vout < +10.7 VDC $\pm 2\%$	Vout < +21.6 VDC $\pm 2\%$
DC-OK max. relay current, when on	50 mA max.	
DC-OK max. relay voltage-drop, when on	< 1.7 VDC @ 50 mA (between connector X20/pin 4-5, see block diagram)	
DC-OK max. relay voltage, when off (max voltage which can be applied externally)	+154 VDC (between connector X20/pin 4-5, see block diagram)	
LED	Green LED on output side indicates that output voltage is ok	

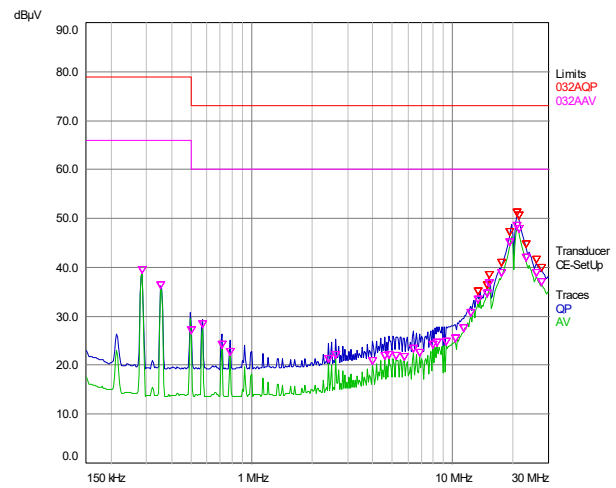
ELECTROMAGNETIC COMPATIBILITY (EMC)

Test	Standard	Test severity levels	Performance Criteria
Surges	EN 50155:2021 EN 50121-3-2:2016/ A1:2019 IEC60571:2012 IEC 62236-3-2:2018	1.2/50 μ s 42 Ω , 0.5 μ F DC power supply port ± 2 kV line to ground ± 1 kV line to line	Criterion B required, but compliant with more strict criterion A
Electrostatic discharge	EN 50155:2021 EN 50121-3-2:2016/ A1:2019 IEC60571:2012 IEC 62236-3-2:2018	± 6 kV contact discharge ± 8 kV air discharge	Criterion B required, but compliant with more strict criterion A
Fast transients	EN 50155:2021 EN 50121-3-2:2016/ A1:2019 IEC60571:2012 IEC 62236-3-2:2018	± 2 kV 5/50 ns tr/th 5 kHz repetition frequency	Criterion A
Radio-frequency common mode	EN 50155:2021 EN 50121-3-2:2016/ A1:2019 IEC60571:2012 IEC 62236-3-2:2018	150 kHz – 80 MHz 10 Vrms (carrier voltage) 80 % AM, 1 kHz Source impedance 150 Ω	Criterion A
Radio-frequency electromagnetic field	EN 50155:2021 EN 50121-3-2:2016/ A1:2019 IEC60571:2012 IEC 62236-3-2:2018	80 MHz – 1000 MHz 20 Vrms/m 80 % AM, 1 kHz unmodulated carrier; 1400 MHz – 2000 MHz 10 Vrms/m 80 % AM, 1 kHz unmodulated carrier; 2000 MHz – 2700 MHz 5 Vrms/m 80 % AM, 1 kHz unmodulated carrier; 5100 MHz – 6000 MHz 3 Vrms/m 80 % AM, 1 kHz unmodulated carrier	Criterion A
Conducted emissions	EN 50155:2021 EN 50121-3-2:2016/ A1:2019 IEC60571:2012 IEC 62236-3-2:2018	150 kHz – 500 kHz: 99 dB μ V quasi-peak 500 kHz – 30 MHz: 93 dB μ V quasi-peak	compliant with more strict EN 55032 Class A
Radiated emissions	EN 50155:2021 EN 50121-3-2:2016/ A1:2019 IEC60571:2012 IEC 62236-3-2:2018	30 MHz – 230 MHz: 40 dB μ V/m quasi-peak at 10 m 230 MHz – 1000 MHz: 47 dB μ V/m quasi-peak at 10 m	Class A required, but compliant with more strict Class B

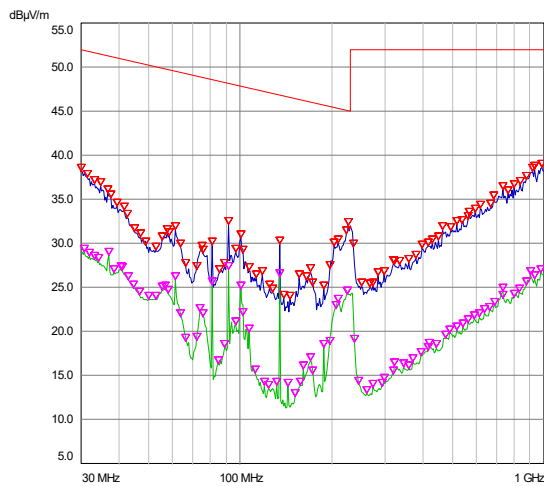
Conducted emissions 150 kHz – 30 MHz @ 24 Vin



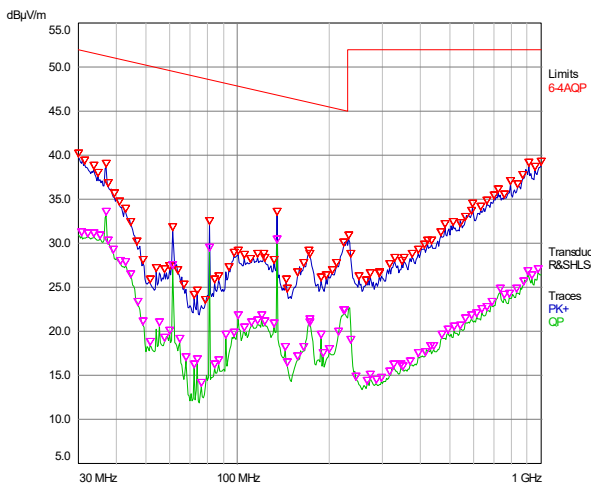
Conducted emissions 150 kHz – 30 MHz @ 110 Vin



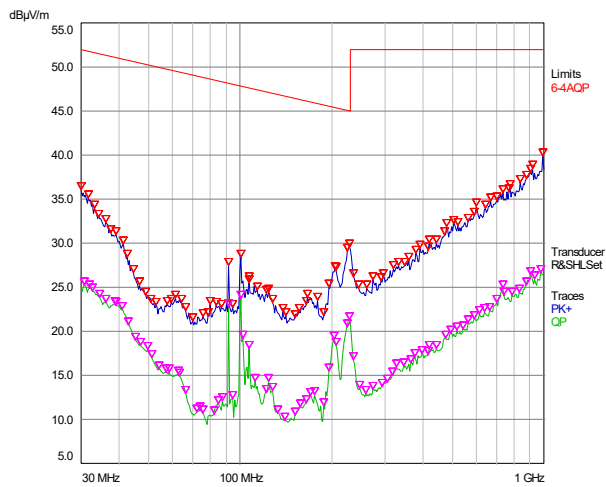
Radiated emissions 30 – 1000 MHz @ 24 Vin vertical polarization



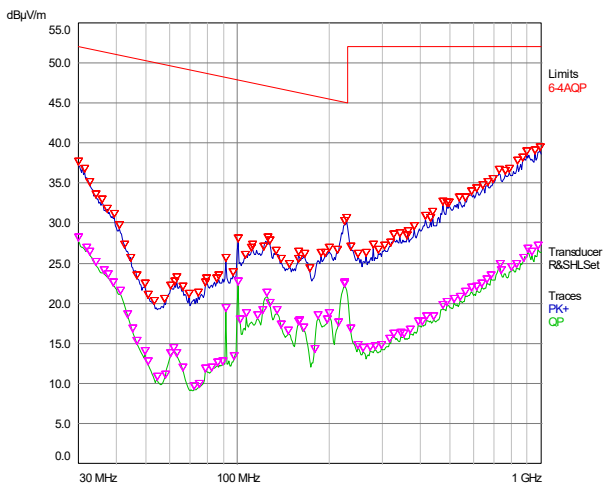
Radiated emissions 30 – 1000 MHz @ 24 Vin horizontal polarization



Radiated emissions 30 – 1000 MHz @ 110 Vin vertical polarization



Radiated emissions 30 – 1000 MHz @ 110 Vin horizontal polarization



ENVIRONMENTAL CHARACTERISTICS

Operating Temperature	-50 °C – +85 °C Class OT6: -40 – +85 °C according to EN 50155:2021 extended down to -50 °C
Cooling	Natural convection
Storage Temperature Range	-50 °C – +100 °C
Altitude Class	Class Ax (>1400 m) according to EN 50125-1:2014: 5000 m above sea level max.
Pollution Degree	PD2 according to EN 50124-1:2017
Shock and Vibration	According to EN 61373:2010, category 1, class B
Rapid Temperature Variation	Class H2 according to EN 50155:2021: -25 °C to +15 °C / 95 %RH, ± 3 K/s +10 °C to +40 °C / 60 %RH, ± 3 K/s
Protective Coating	Class PC2 according to EN 50155:2021 The board is protected on both sides with a protective transparent fluorescent-pigment coating to prevent deterioration or damage due to moisture and atmospheric contaminants. The coating is compliant with class 2, according to IPC-A-610H
Prohibited Substances	For detailed information about RoHS, REACH, UNIFE (RISL), Dodd-Frank Act's Section 1502 on Conflict Minerals refer to the intreXis environmental policy document on www.intrexis.ch
Fire behaviour	EN 45545-2:2020 compliant with all Hazard Levels HL1-HL3 NFPA 130: 2023

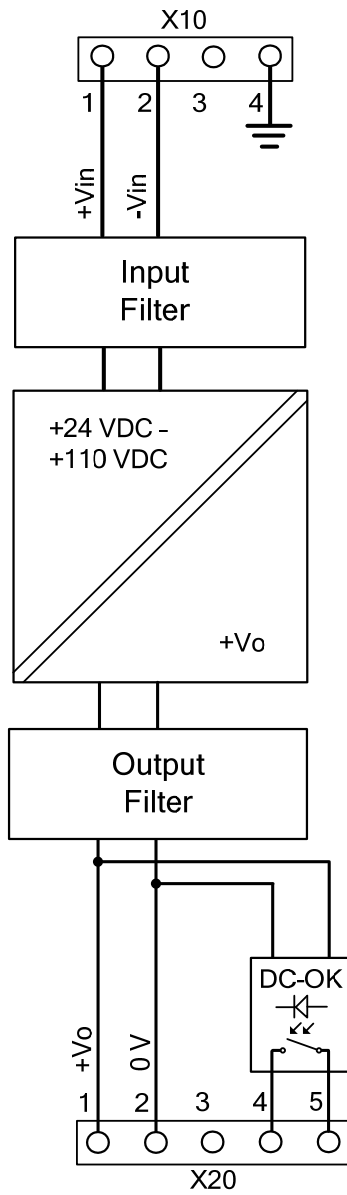
GENERAL CHARACTERISTICS

General Standard	EN 50155:2021 Railway applications - Rolling stock - Electronic equipment IEC 60571:2012 Railway applications - Electronic equipment used on rolling stock			
Useful Life Class	Class L4 (20 years) according to EN 50155:2021			
MTBF Calculation method: MIL-HDBK-217-F2 Using demonstrated Failure Rates of components	Ground Benign (GB), +25 °C	Ground Benign (GB), +40 °C	Ground Fixed (GF), +40°C	Ground Mobile (GM), +40 °C
	8 631 000 h	5 970 000 h	1 097 500 h	593 000 h
Marking	Label with following information: - part number, output voltage, output power - serial number for identification and traceability (printed in text format and as barcode) - revision index			
Connector identification	Printings on PCB to identify connectors and pin 1			

SAFETY AND INSULATION

Safety Standards	IEC 62368-1:2023 EN IEC 62368-1:2024/A11:2024
Insulation Coordination	According to EN 50124-1:2017
Input, Output, Chassis	The input is galvanically isolated to the output. Input, output and signals are galvanically isolated to the mounting holes (chassis). The DC-OK Signal is isolated to the output and input (see blockdiagram)
Input to Output	Isolation Voltage: 3300 Vrms at 2000 m altitude, 60 s 2500 Vrms at 5000 m altitude, 60 s Clearance: 5.5 mm Creepage: 5.5 mm For the type test, the Y-capacitors must be removed according to EN 61287-1:2014. Please refer to the intreXis whitepaper "Insulation Test" for detailed information. For the routine test according to EN 50124-1:2017 of Input to Output and Input to Chassis, intreXis AG recommends the following procedure: connect Output to Chassis, apply a test-voltage of 2125 VDC or 1500 VAC with trigger threshold ≥ 10 mA, 10 s between Input and Chassis. For this test, the Y-capacitors must not be removed. Please refer to the intreXis whitepaper "Insulation Test" for detailed information.
Input to Chassis	Isolation Voltage: 2000 Vrms, 60 s Clearance: 2.5 mm Creepage: 2.5 mm For the routine test, see above.
Output to Chassis	Isolation Voltage: 2000 Vrms, 60 s Clearance: 2.5 mm Creepage: 2.5 mm
DC-OK Signal to Input DC-OK Signal to Output DC-OK Signal to Chassis	Isolation Voltage: 2000 Vrms, 60 s Clearance: 2.5 mm Creepage: 2.5 mm
Insulation Resistance	Input – Chassis: > 550 M Ω Input – Output: > 550 M Ω Output – Chassis: > 550 M Ω DC-OK Signal to Input: > 550 M Ω DC-OK Signal to Output: > 550 M Ω DC-OK Signal to Chassis: > 550 M Ω Test-voltage: 500 VDC

BLOCK DIAGRAM

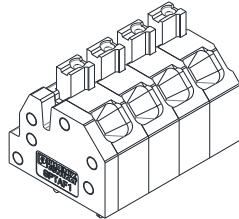


CONNECTOR TYPES

**Input connector
X10**

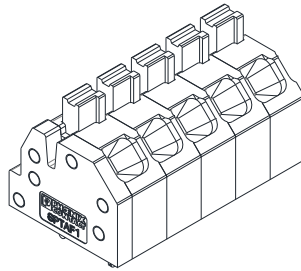
Phoenix SPTAF 1/ 4-3,5-EL or equivalent
Pitch: 3.5 mm
Number of pins: 4

Push-in spring connection for wire-size of 1.5 mm² max. Strip length: 8 mm.

**Output connector
X20**

Phoenix SPTAF 1/ 5-3,5-EL or equivalent
Pitch: 3.5 mm
Number of pins: 5

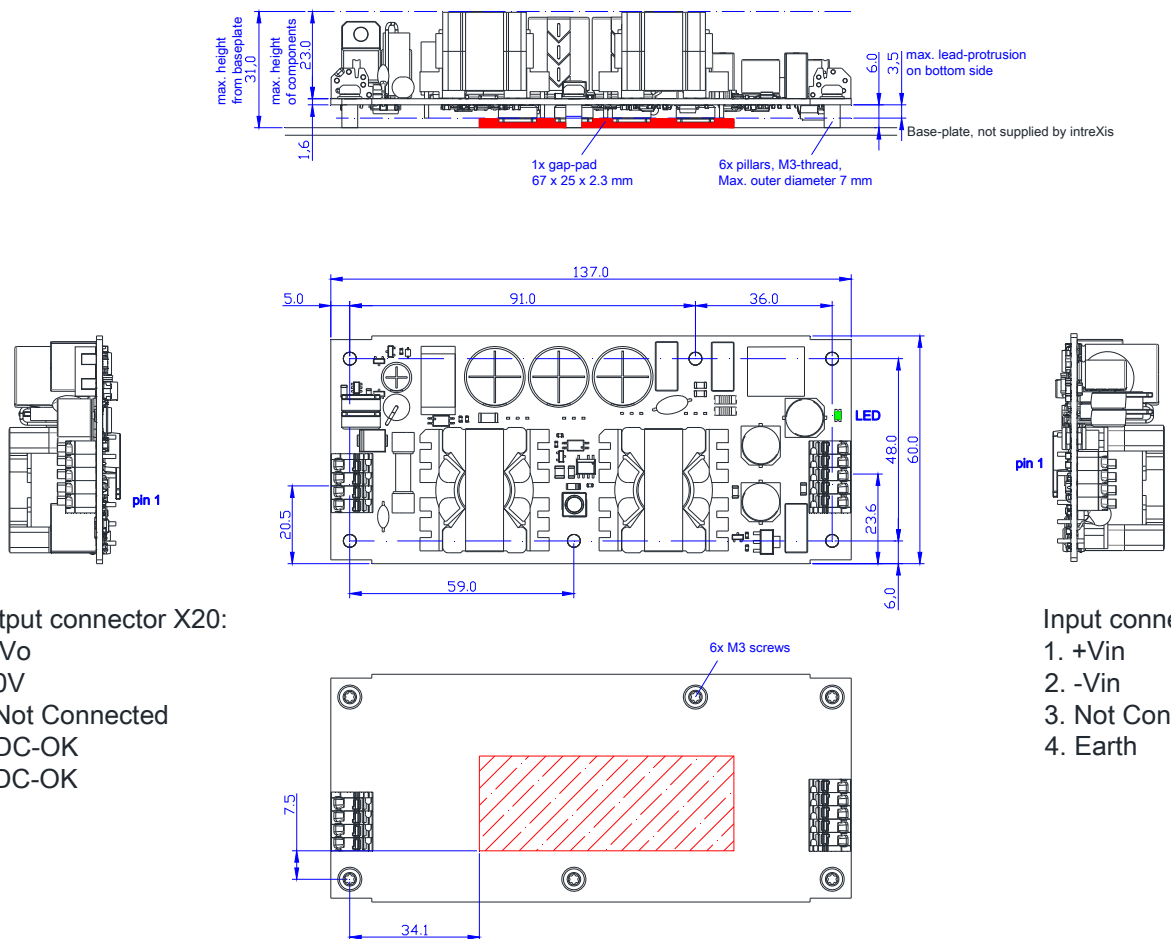
Push-in spring connection for wire-size of 1.5 mm² max. Strip length: 8 mm.



MECHANICAL CHARACTERISTICS

Overall dimensions	According to the drawing (millimeters, unless otherwise specified)
Weight	210 g
IP code	IP00
Mounting	Mounting in any position is allowed

Mechanical drawings:



Output connector X20:

1. +Vo
2. 0V
3. Not Connected
4. DC-OK
5. DC-OK

Input connector X10:

1. +Vin
2. -Vin
3. Not Connected
4. Earth

On the board, six mounting holes are provided to fix the unit with pillars, using M3 screws (pillars and screws not supplied). The pillars must be selected to ensure 6 mm gap between the base-plate and the PCB, as shown in the drawing. Longer pillars can be used, if no gap-pads are used (see below). Screws, pillars and base-plate must be electrically conductive.

Gap-pads for cooling:

The gap-pads must be ordered separately from intreXis AG, ordering code: **GAPPAD_67X25X2.3**.
The base-plate must be thermally conductive (e.g. steel or aluminium).

Gap-pad properties:

Dimensions	67 x 25 mm
Thickness	2.3 mm
Hardness (Shore 00)	30 – 45
Operating temperature	Tmin: ≤ -50 °C Tmax: ≥ +150 °C
Thermal Conductivity	> 3.0 W/mK
Breakdown voltage	> 5.0 kV/mm

TEST COMPLIANCE SUMMARY (CERTIFICATE OF CONFORMITY)

Performed Test	Standard	Test conditions	Performance level	Reference document
Visual inspection	EN 50155:2021 IEC60571:2012	Aspect, dimensions, weight, markings	According to design specification	Test report
Performance test	EN 50155:2021 IEC60571:2012	Ambient temperature. Nominal supply voltage: 24 VDC and 110 VDC Supply voltage range: 16.8 – 137.5 VDC (static)	Criterion A	Test report
Power supply test Supply overvoltages	EN 50155:2021 IEC60571:2012	Supply voltage: 14.4 – 154 VDC 1s	Criterion B required, but tested with more strict criterion A	Test report
Insulation test	EN 50155:2021 IEC60571:2012	Input – Chassis 500 VDC Input – Output 500 VDC Output – Chassis 500 VDC DC-OK Signal – Output DC-OK Signal – Input DC-OK Signal – Chassis Repeated after Voltage withstand test Voltage withstand test: Input – Chassis 2000 Vrms 60 s Input – Output 3300 Vrms 60 s Output – Chassis 2000 Vrms 60 s DC-OK Signal – Input 2000 Vrms 60 s DC-OK Signal – Output 2000 Vrms 60 s DC-OK Signal – Chassis 2000 Vrms 60 s	Resistance > 20 MΩ (measured >550 MΩ, exceeding the requirement) No disruptive discharge	Test report
Low temperature test Cold start test	EN 50155:2021 IEC60571:2012	T = -50 °C	Criterion A (exceeds the requirements, extended range down to -50 °C for extremely cold environments)	Test report
Dry heat test	EN 50155:2021 IEC60571:2012	T = +70 °C (cycle A) T = +85 °C (cycles B and C)	Criterion A	Test report
Low temperature storage test	EN 50155:2021 IEC60571:2012	T = -50 °C	Criterion A after recovery period	Test report
Cyclic damp heat test	EN 50155:2021 IEC60571:2012	T = +55 °C and +25 °C (2 cycles)	Criterion A	Test report
Electromagnetic compatibility test	EN 50155:2021 EN 50121-3-2:2016/ A1:2019 IEC60571:2012 IEC 62236-3-2:2018	See section 'Electromagnetic Compatibility (EMC)'		Testreport_EMC R-EM-354-1222-03A
Shock and vibration test	EN 50155:2021 IEC60571:2012	EN 61373:2010, Category 1, class B		Compliant

Performed Test	Standard	Test conditions	Performance level	Reference document
Fire behaviour	EN 45545-2:2020	PCB: R25 (EN 60695-2-11, T16: No ignition at T=850 °C)	PASSED (HL1-HL2-HL3)	Fire_Certificate_IC37X
Safety	IEC 62368-1:2023 EN IEC 62368-1:2024/ A11:2024	According to the standard	PASSED	Safety_ Certificate_IC371_2 AT-354-1125-01A

Furthermore, the product is compliant with the requirements of:

- EC 1907/2006 (December, 18th 2006)

REACH regulation: Registration, Evaluation, Authorisation
and Restriction of Chemicals.

- UNIFE

Railway Industry Substance List

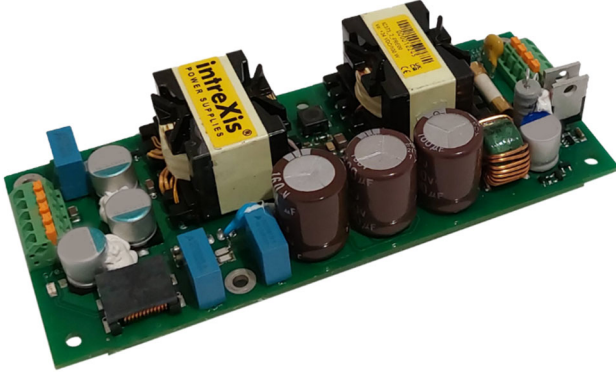
Neuhausen am Rheinfall, 27.11.2025

Thomas Schiegg
intreXis AG



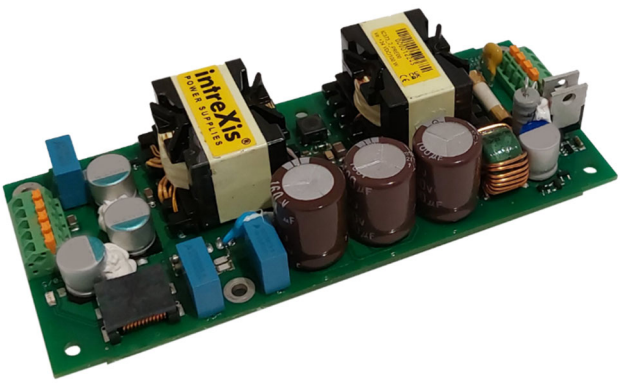


EU DECLARATION OF CONFORMITY (DoC)

Product Models	IC371_2, IC373_2	
Name and address of the manufacturer	intreXis AG Tobelraastrasse 4 CH-8212 Neuhausen am Rheinfall Switzerland	
This declaration of conformity is issued under the sole responsibility of the manufacturer.		
IC371_2, IC373_2 		
The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:	Low Voltage Directive: RoHS Directive: EMC Directive:	2014/35/EU 2011/65/EU, (EU) 2015/863 2014/30/EU
References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared:	Low Voltage Directive: RoHS Directive: EMC Directive: Railway Applications:	EN IEC 62368-1:2024/ A11:2024 EN IEC 63000:2018 EN 50121-3-2:2016/ A1:2019 EN 50155:2021
Signed for and on behalf of:	intreXis AG Tobelraastrasse 4 CH-8212 Neuhausen am Rheinfall Switzerland	
Place, Date of issue	Neuhausen am Rheinfall, 27.11.2025	
Name, Function, Signature	Thomas Schiegg, Managing Director: 	



UK DECLARATION OF CONFORMITY (DoC)

Product Models	IC371_2, IC373_2	
Name and address of the manufacturer	intreXis AG Tobelraastrasse 4 CH-8212 Neuhausen am Rheinfall Switzerland	
This declaration of conformity is issued under the sole responsibility of the manufacturer.		
IC371_2, IC373_2 		
The object of the declaration described above is in conformity with the relevant UK legislation:	UK SI 2016 No. 1101:	Electrical Equipment (Safety) Regulations 2016
	UK SI 2012 No. 3032:	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012
	UK SI 2016 No. 1091:	Electromagnetic Compatibility Regulations 2016
References to the relevant standards used or references to the other technical specifications in relation to which conformity is declared:	Low Voltage Directive:	BS EN IEC 62368-1:2024/A11:2024
	RoHS Directive:	BS EN IEC 63000:2018
	EMC Directive:	BS EN 50121-3-2:2016/A1:2019
	Railway Applications:	BS EN 50155:2021
Signed for and on behalf of:	intreXis AG Tobelraastrasse 4 CH-8212 Neuhausen am Rheinfall Switzerland	
Place, Date of issue	Neuhausen am Rheinfall, 27.11.2025	
Name, Function, Signature	Thomas Schiegg, Managing Director: 	

INSTALLATION AND OPERATION

Safety	 Warning / Caution! The power supplies should be installed and put into operation only by qualified personnel. Before installing or removing the unit, disconnect the power from the system.
Servicing	In case of failures, malfunctions or defects, the converter must be returned to intreXis for analysis and repair. In particular, the converter should be sent to intreXis for analysis if any damage has occurred to the unit (e.g. the unit dropped). Any attempts to open and repair the unit could void the warranty and could expose the operator to hazardous voltages.
Spare Parts	List and drawings of spare parts are not provided, since the failed units have to be returned to intreXis for analysis and repair.
Disposal	Disused units must be collected separately and disposed at a suitable recycling facility.
Connecting the Cables	Ensure that proper wires are used according to the input current specifications. Prepare the cables according to the specifications of the particular connector used.
Operation of the Unit	Once the input power is applied, the output voltage is enabled.