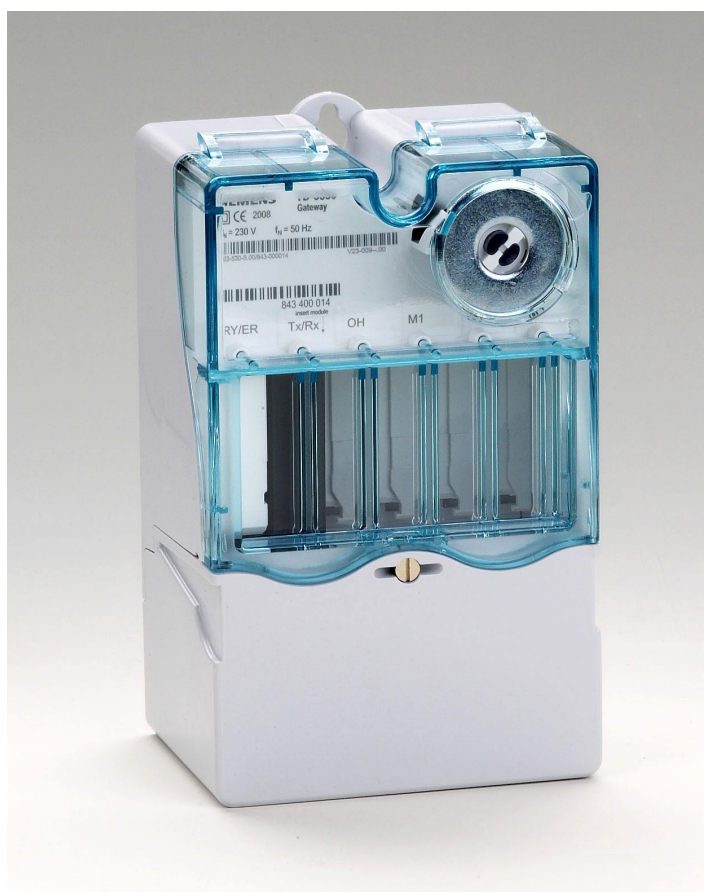


AMIS

Automated Metering and Information System

TD-3520/TASU30 Load Switching Device

Load Switching Device according to Clock Program or Command



- Load switching according to timer program or on command from the control center (load shedding, reloading, etc.)
- Integrated LV-DLC-communication
- Remote modification of the switching program
- Configurable with up to 5 relays
- 52 On/Off switching pairs per relay
- Random generator for On/Off switching delay, to avoid load peaks in the network
- Infrared interface for local read-out and parameter setting with PDA (Personal Digital Assistant) and Web-Browser
- Internal clock (synchronized with the AMIS system time, i.e. GPS-accuracy) and calendar with calculated and freely definable holidays)
- Monitoring of the input and output voltage of every relay
- Manipulation contact

Application and Function

The load switching device TD-3520/TASU30 (Terminal Adapter Switching Unit) is a device with microprocessor support and replaces traditional ripple control receivers. The load switching takes place according to timer program or on command from the control center station (load shedding, recharging, etc.). A random generator for On/Off switching delay avoids load peaks in the network.

The integrated bidirectional communication enables a secured transmission of switching commands unlike existing ripple control systems. It also permits a complete remote parameterization of the devices and therefore a flexible adaptation to the requirements of the energy supplier and the network operator.

The load switching device TD-3520/TASU30 is a component of the complete solution AMIS for the acquisition of consumption data and the management of distribution networks. AMIS stands for Automated Metering and Information System.

The load switching devices communicate with the higher-level devices (data concentrators of the series CP-341x) over the low-voltage energy distribution network and can be parameterized and read-out remotely.

The mechanical design of the load switching device TD-3520/TASU30 is identical to traditional ripple control receivers. Therefore a troublefree installation into existing switch cabinets is possible using the existing connection cables.

Every TD-3520/TASU30 load switching device can be configured with the up to 5 TD-3529 relay modules. The modules configured are detected automatically by the load switching device.

The individual relay modules are controlled via commands or by the load switching program (parameters). The load switching programs can be managed in the transaction server.

For every configured relay module a voltage monitoring is performed before and after the relay contact in order to verify a switching of the relay unambiguously. The error signalling is retained.

The load switching device has an internal clock, synchronized with the AMIS system time, i.e. GPS-accuracy, and calendar with calculated and freely definable holidays.

The service interface is realized by means of an infrared connection, which is defined in the standard IEC62056-21. It consists of a transmit diode and a receive diode on the load switching device and an infrared sensor head (according to IEC62056-21) that can be connected to a computer or PDA using RS232 or USB-connector. The load switching device can be parametrized and diagnosed via the IEC62056-21 interface.

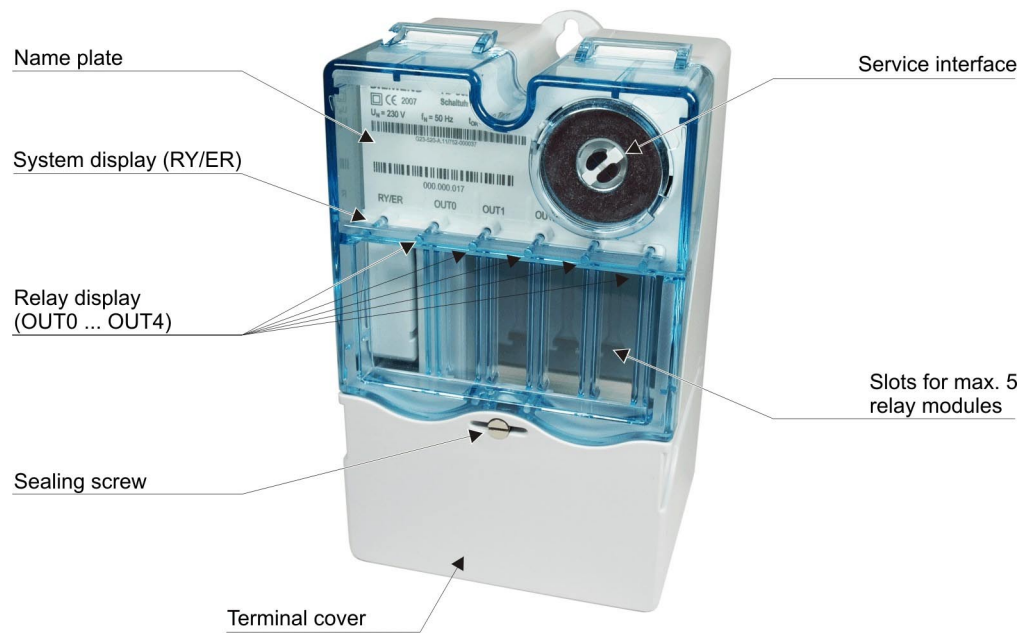
Further an integrated webserver is provided via this service interface which also can be used for diagnostics and parameter setting.

A contact situated between the terminal cover and the housing detects, whether the terminal cover is open or closed (manipulation contact)

The load switching device TD-3520/TASU30 has one single lead seal, which is used commonly for the terminal area and the configured relay modules.

With the help of one multicolored LED (RY/ER) and 5 single-colored LED's (L1-L5) the states and values of the load switching device are displayed.

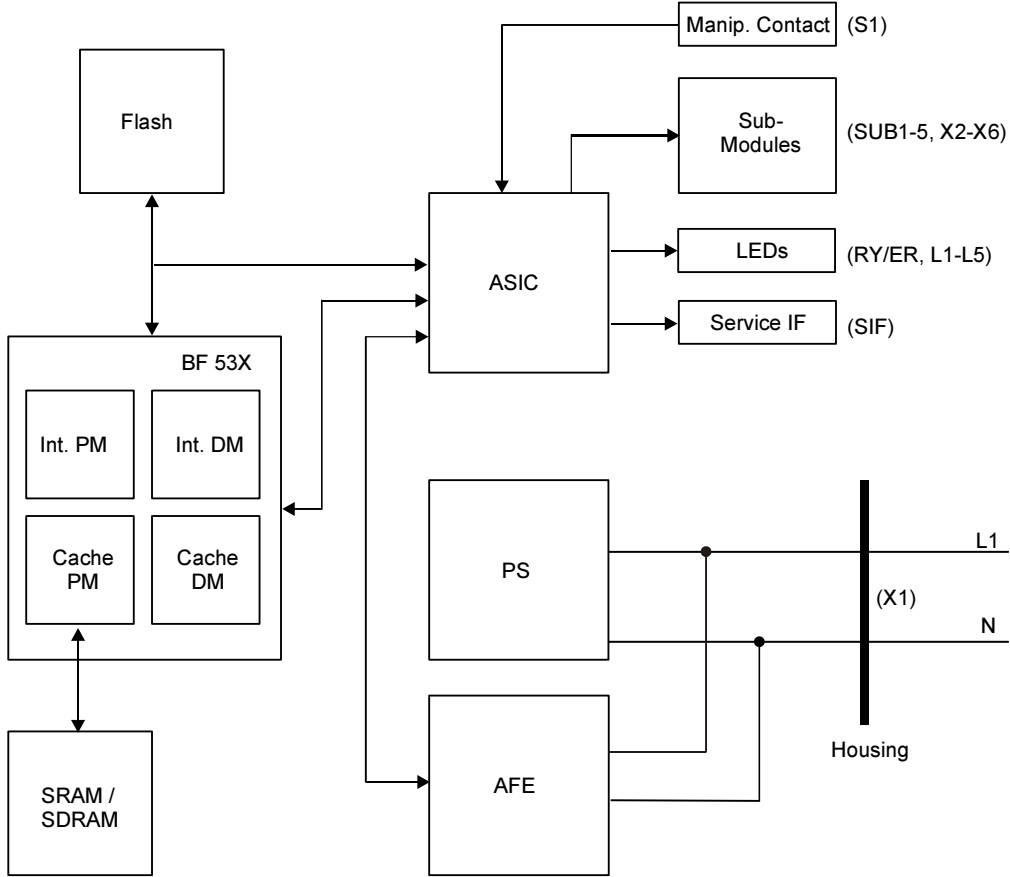
Mechanical Design



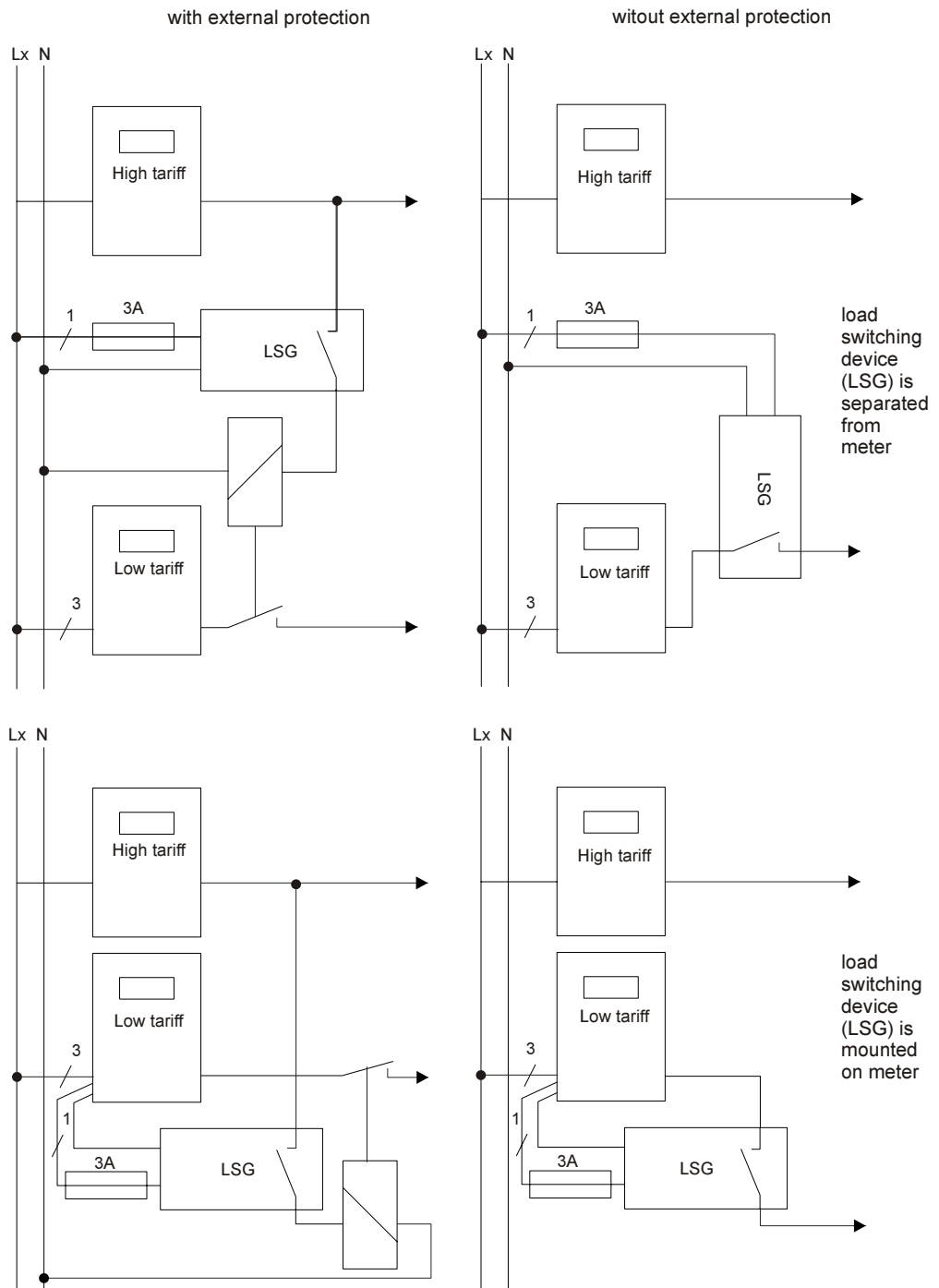
With opened terminal cover and 5 relay modules



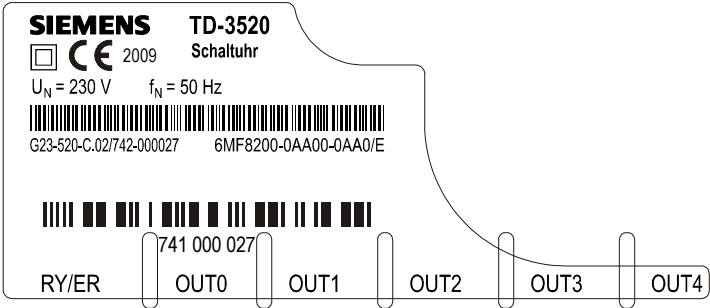
Block Diagram



External Circuitry



Name plate



Technical Specifications TD-3520

Parameter description	TD-3520
Nominal voltage	230 VAC
Voltage range	230 VAC -20% / +15%
Nominal frequency	50 Hz
Power consumption	nominal 3.4 W, max. 8.8 VA
Display elements	1 multicolored LED (RY/ER) and 5 single colored LEDs (L1-L5)
Optical service interface	According to IEC62056-21 Mode C or via integrated Web-Server
Interface for remote read-out and parameter setting	DLC-communication according to EN 50065 in the frequency band 9 - 95 kHz (A-Band)
Possibility to update firmware	yes
Max. number of relay modules TD-3529	5, automatic detection
Number of load switching programs	1 per configured relay module, 52 ON/OFF-switching pairs
Installation of the relay modules under voltage	yes
Voltage monitoring before and after the relay contacts of the relay modules TD-3529	yes
Contact protection for the transition relay/load switching device and/or for the connection terminals of the relay	yes
Manipulation contact	1 between terminal cover and housing for the detection of whether the terminal cover has been removed.
Degree of protection	IP54
Connection terminals	6 mm ² for power supply 4 mm ² for relay modules
Dimensions	104 x 163 x 79 mm (WxHxD)
Weight	Approx. 450g

Applicable Standards	
IEC 62052-21	General
IEC 62056-21	Local data read-out (replaces IEC 1107)
EN 50065-7, EN50065-1, EN50065-2-3	DLC-transmission
2	Protection class
IP54	Degree of protection
IEC 62052-21	Electrical environmental conditions
IEC 62052-21	Climatic environmental conditions
IEC 62052-21	Mechanical environmental conditions

Technical Specifications TD-3529 (Relay Module)

Parameter description	TD-3529
Galvanic insulation	no
Type of relay	bistable
Contact type	Make contact
Max. switching capacity	4 kVA
Max. switching voltage	230 VAC -20% / +15%, 50Hz
Max. switching current	16 A at cos phi = 1 (resistive) 8 A at cos phi = 0,4 (inductive)
Max. number of switching cycles	30,000 at 16 A, cos phi = 1 (resistive) 30,000 at 8 A, cos phi = 0.4 (inductive) 100,000 without load
Voltage monitoring	max. input voltage : 380 VAC -20% / +15%, 50Hz

Protection against contact, dust and water

	Types, Values, Ranges, Settings	Product Standard
Degree of protection	IP 54	IEC 62052-21

Mechanics

Mechanics	Types, Values, Ranges, Settings
Mechanical design of the device	Housing according to DIN 43857
Dimensions (WxHxD)	105 x 170 x 80 mm
Tightening torque of the sealing screw	The sealing screws are tightened with 0.3 Nm and afterwards turned back so far, until the cross hole is in the direction of the sealing-wire lead-through. (<1/2 revolution)

Climatic Environmental Conditions

Parameter		Range	Testing Standard	Product Standard
Temperature min. (device environment) ²⁾		-25°C		IEC 62052-21
Temperature max. (device environment)		+55°C		IEC 62052-21
Relative air humidity		<=95%		IEC 62052-21
Dry heat ¹⁾	72 h	70°C	IEC 680068-2-2	IEC 62052-21
Cold ¹⁾	72 h	-25°C	IEC 680068-2-1	IEC 62052-21
Moisture heat ¹⁾	72 h	40°C	IEC 680068-2-78	IEC 62052-21
Heating		25°C		IEC 62052-21

¹⁾... not in operation



²⁾ **Warning**

The load switching device TD-3520 may not be mounted near to heat sources (e.g. heating- or dryer vents, air conditioners, lamps, etc.).

Mechanical Environmental Conditions

Not in operation, without packing

Parameter		Values	Testing Standard	Product Std.
Spring hammer		0.2 J	IEC 60068-2-75	IEC 62052-21
Oscillation 10...60 Hz		0.075 mm	IEC 60068-2-6	IEC 62052-21
Oscillation 60 150 Hz		1 g	IEC 60068-2-6	IEC 62052-21
Surge 18 ms		30 g	IEC 60068-2-27	IEC 62052-21
Heat and fire, 30 s			IEC 60695-2-11	IEC 62052-21
	Terminals	960°C		
	Housing	650°C		

Electrical Ambient Conditions

Immunity / EMC

Parameter		Value	Testing Standard	Product Standard
Nominal voltage AC		230 V		IEC 62052-21
Voltage tolerance AC		-20 / +15 %		IEC 62052-21
Immunity against discharge of static electricity (ESD)		15 kV-L	IEC 61000-4-2	IEC 62052-21
Immunity against electromagnetic fields amplitude modulated	I = In I = 0	10 V/m 30 V/m ³⁾	IEC 61000-4-3	IEC 62052-21 IEC 62052-21
Immunity against electromagnetic fields pulse modulated		10 V/m	IEC 61000-4-3	
Immunity against electromagnetic fields 50Hz	continuous	100 A/m	IEC 61000-4-8	
Immunity against electromagnetic fields 50Hz	Short-term disturbance	300 A/m	IEC 61000-4-8	
Fast transient disturbance	common	4 kV ⁴⁾	IEC 61000-4-4	IEC 62052-21
Impulse voltage 1.2/50 µs	normal ¹⁾	4 kV	IEC 61000-4-5	IEC 62052-21
Immunity against induced HF voltage	common normal	10 V ²⁾ 134/66 dBµV	IEC 61000-4-6	IEC 62052-21
Radio interference voltage - quasi peak value		class B	CISPR 22	IEC 62052-21
Radio interference voltage - mean value		class B	CISPR 22	IEC 62052-21
Disturbance voltage DLC	Bandwidth (Broadband)	>5 kHz	EN 50065-1	
	30 kHz (95 kHz)	5 V _{PK}		
	Disturbance voltage (out BW)	see ⁵⁾		
Device impedance (receive/transmit)	3 kHz 9 kHz	≥10 Ω/arbitrary		
	9 kHz ... 95 kHz (in BW)	≥50 Ω/arbitrary		
	9 kHz ... 95 kHz (out BW)	arbitr./arb.		
	95 kHz ... 148.5 kHz	>5 Ω / >3 Ω		

¹⁾ only in differential mode (line to line), acc. to IEC 62052-11, chap. 7.5.6.

²⁾ for DLC-communication at levels between 3 V/m and 10 V/m the evaluation criterion B (acc. to EN 50065-2-3) has to be applied.

³⁾ for DLC-communication at levels between 10 V/m and 30 V/m the evaluation criterion B (acc. to EN 50065-2-3) has to be applied.

⁴⁾ peak voltage acc. to EN 50065-2-3 (2 kV) is exceeded

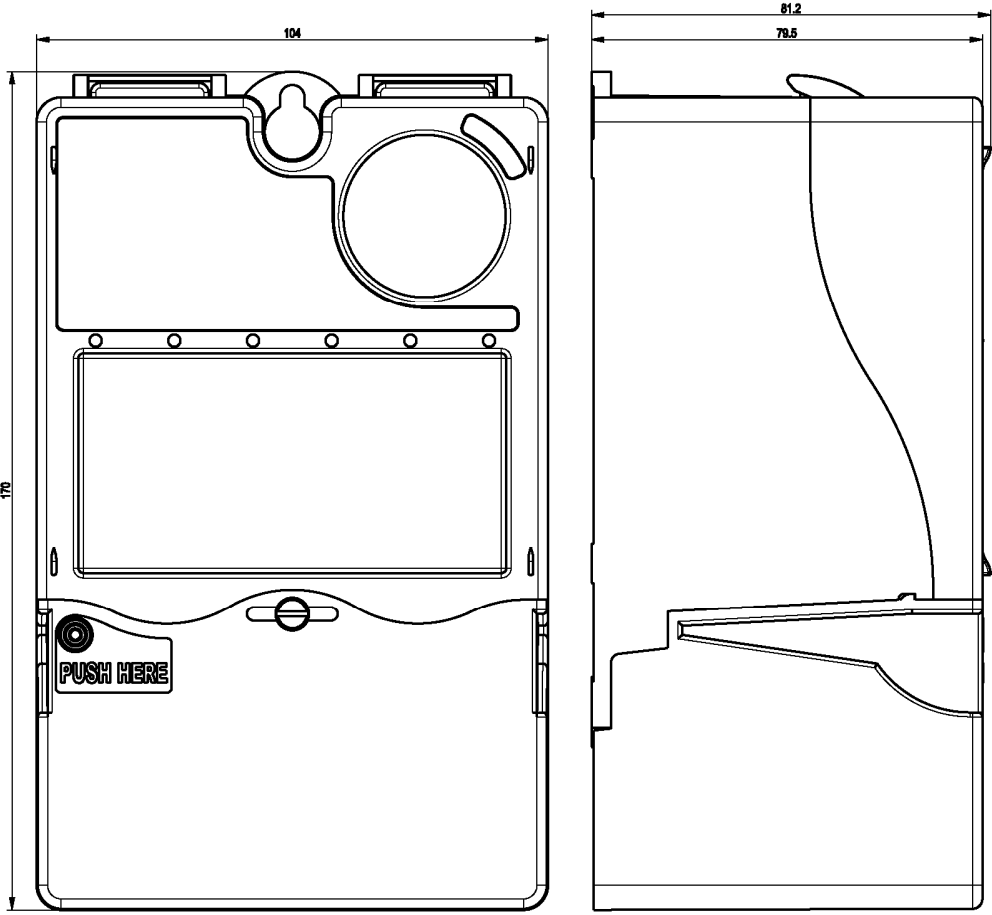
⁵⁾ limiting values for surge voltage acc. to EN 50065-1

Insulation

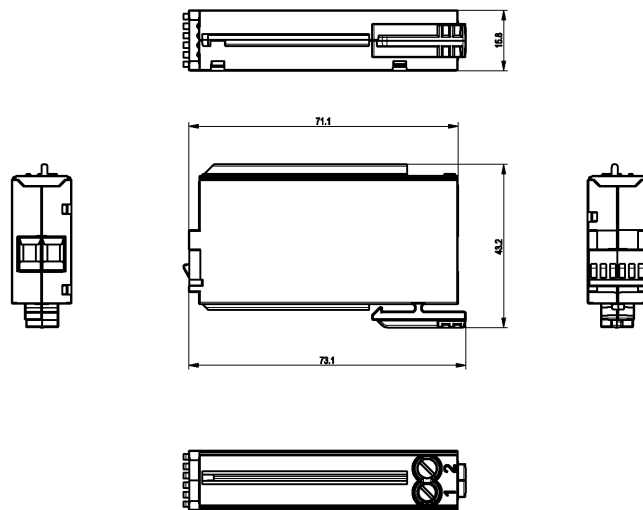
Parameter	Value	Note
Protection class	2	
Peripheral voltage circuits	$U_N \leq 40V_{\text{eff}}$	These circuits are dimensioned as <u>secondary circuits</u> (cabling inside buildings)
	$40V_{\text{eff}} < U_N \leq 230/400V_{\text{eff}}$	These circuits are dimensioned as <u>primary circuits</u> (network cabling, no insulating transformer required, cabling outside buildings)
Overvoltage category	IV	according to VDE110, Tab.1 The value is to be ensured with high-voltage fuse.
Degree of pollution	2	within the device (protection against ingress of moisture and dirt)
	3	at the terminal (open, within the control cabinet)
Insulation material	IIIa	(Printed circuit board $175 \leq CTI \leq 400$)
Insulation degree	Streng. Insulation	L1, N towards - earth - touchable parts (slots in the housing) - against circuits with $<40V_{\text{eff}}$
	Operation Insulation	within current circuits (L1 and N)

Parameter	Value	Testing Standard	Product Standard
AC-Test	4 kV		IEC 62052-21
Protection class	2		
Isolation surge voltage 1,2/50 μ s	common	6 kV	IEC 60060-1 IEC 62052-21
Clearance / creeping distance	amplified insulation	5.5/6.3 mm	IEC 62052-21
Clearance / creeping distance	Operation insulation		
Clearance	Surge 4 kV	3.0 mm	IEC 60664
Creeping distance	400 VAC	2.0 mm	
	230 VAC	1.0 mm	

Dimensional Drawings TD-3520



Dimensional Drawings TD-3529



Literature

Brochure AMIS	E50001-U330-A186
Data Sheet AMIS Meter TD-351x/EMVK30/EMAS30	M23-050-1
Data Sheet AMIS Data Concentrator CP-341x/CPC30	M23-051-1
Data Sheet AMIS Power Supply Module PS-3460	M23-052-1
Data Sheet AMIS Load-Switching Device TD-3520/TASU30	M23-053-1
Data Sheet AMIS Meters Protocol Converter TD-3530/TACU30	M23-054-1
Data Sheet AMIS Expansion Module MT-3621	M23-016-1
AMIS Ordering Code	D23-039-1

Disclaimer of Liability

Although we have carefully checked the contents of this publication for conformity with the hardware and software described, we cannot guarantee complete conformity since errors cannot be excluded. The information provided in this manual is checked at regular intervals and any corrections that might become necessary are included in the next releases. Any suggestions for improvement are welcome.

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