Transmitter AMU-II Pharmacon

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ANALYTICAL INSTRUMENTS

Electronic transmitter and controller for the measurement of specific conductivity in water for pharmaceutical purposes.

Application examples

- Monitoring of production, storage and distribution systems for purified water (PW) and water for injection (WFI) in accordance with the requirements of the Pharmacopoeias.

Measuring range

- From 0.055 µS/cm to 2.00 mS/cm.
- Displays uncompensated and temperature-compensated (25 °C) conductivity simultaneously.

Sensors

- Connections for a 2-electrode conductivity sensor with integrated Pt1000 temperature sensor.
- Use with high accuracy conductivity sensor: Swansensor Pharmacon: delivery including traceable calibration and material certificates.

Compliance

- Pre-programmed USP ‹645› stage 1 conductivity limits with individual action limit of 20–100 % configurable.
- Verification of conductivity and temperature measurement circuits with optional traceable high accuracy test resistor kit.
- On-site verification of conductivity measurement with optional portable conductivity meter AMI Inspector Pharmacon.

Instrument features

- Transmitter for panel mounting with IP54 protection (front).
- Large, backlit LC display and simple, menu-driven operation.
- Various connection options: two analog signal outputs, two limit relays, one alarm relay and one relay input.
- Modbus, Profibus, HART or USB as an option.

Order numbers:	AMU-II Pharmacon	A−13.660._00
Power supply	100 – 240 VAC, 50/60 Hz	1
	10 – 36 VDC...	2
Option	RS485 interface with Modbus RTU or Profibus protocol	A−81.460.010
	USB interface	A−81.460.020
	HART interface	A−81.460.030
Accessories	For all options and details, please visit our website at www.swan.ch.	
	Swansensor Pharmacon	A−87.335.X00
	Test resistance plug	A−85.134.020

Transmitter AMU-II Pharmacon
Data sheet no. DenA13660X00

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Conductivity Measurement

Conductivity sensor type
2-electrode conductivity sensor

Measuring range / Resolution

Measuring range	Resolution
0.055 to 0.999 µS/cm	0.001 µS/cm
1.00 to 9.99 µS/cm	0.01 µS/cm
10.0 to 99.9 µS/cm	0.1 µS/cm
100 to 999 µS/cm	1 µS/cm
1.00 to 2.00 mS/cm	0.01 mS/cm

Automatic range switching.

System accuracy
0.05 to 500 µS/cm	±2 %
500 to 2000 µS/cm	±3 %

or ±0.001 µS/cm whichever is greater.

Ranges and accuracy with Swansensor Pharmacon (cell constant ~0.08 cm^{-1}).

For further information, refer to the data sheets of the respective Swan sensors.

Sensor cell constants
Selectable: from 0.005 to 10 cm^{-1}

Temperature compensations
- Absolute (none)
- Non-linear function (NLF) for high purity water
- Linear coefficient 0.00 – 10.00 %/°C
- Various chemicals

USP <645>
- Pre-programmed stage 1 conductivity limits.
- Individual action limit of 20–100 % configurable.

Auxiliary sensors
- Temperature measurement with Pt1000 type sensor (DIN class A).
  Measuring range: -30 to +250 °C
  Accuracy (0-50 °C)   ±0.25 °C
  Resolution: 0.1 °C
- Optional: sample flow measurement with digital SWAN sample flow sensor.

Transmitter Specifications and Functionality

Electronics case:	Noryl® resin
Protection degree:	IP54 (front)
Display:	backlit LCD, 64 x 32 mm
Electrical connectors:	clamping yoke
Dimensions:	96 x 96 x 85 mm
Weight:	0.30 kg
Ambient temperature:	-10 to +50 °C
Humidity:	10 - 90% rel., non-condensing

Power supply
AC version:	100 – 240 VAC (±10%), 50/60 Hz (±5%)
DC version:	10 – 36 VDC
Power consumption:	max. 3 VA

Electrical Connection Scheme
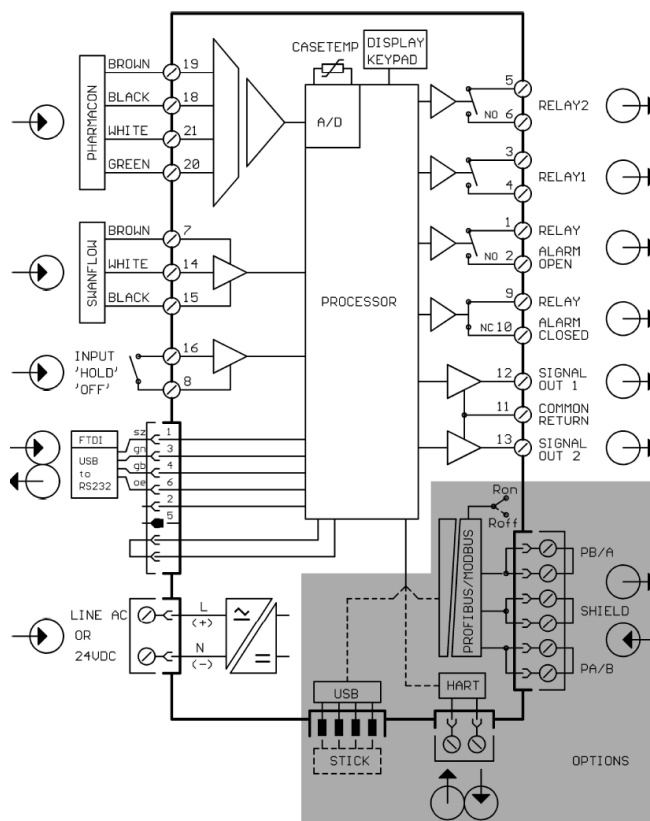
Operation
User menus in English, German, French, Spanish and Chinese.
Multi-level user management / access control.
Histories for events / performance verifications.

Safety features
No data loss after power failure, all data is saved in non-volatile memory.
Overvoltage protection of inputs and outputs.
Galvanic separation of measuring inputs from signal outputs.

Transmitter temperature monitoring
With programmable high/low alarm limits.

Real-time clock with calendar
For action time stamp and preprogrammed actions

Alarm relay
Two potential-free contacts for summary alarm indication for programmable alarm values and instrument faults (one normally open and one normally closed contact).
Maximum load: 100 mA / 50 V

Input
One input for potential-free contact.
Programmable hold or remote off function.

Relay outputs
Two potential-free contacts programmable as limit switches for measured values, controllers or timer with automatic hold function.
Rated load: 100 mA / 50 V

Signal outputs
Two programmable signal outputs for measured values (freely scalable, linear or bilinear) or as controller outputs.
Current loop: 0/4 – 20 mA
Maximum burden: 510 Ω
Type: current source

RS232 interface
For data logger download to PC and for transmitter firmware updates. Requires the optional USB to RS232 interface converter.

Communication interface options
- RS485 interface with Modbus RTU or Profibus DP protocol, galvanically separated
- USB interface for logger download
- HART interface