Continuous Gas Analyzers POLARIS-ECO 301X (hot probe) and POLARIS 201X (cold probe).

Models:

POLARIS-ECO 3013(.D).NO_2

POLARIS-ECO 3014(.D).SO_2

POLARIS-ECO 3015(.D).CO

POLARIS-ECO 3016(.D).NO

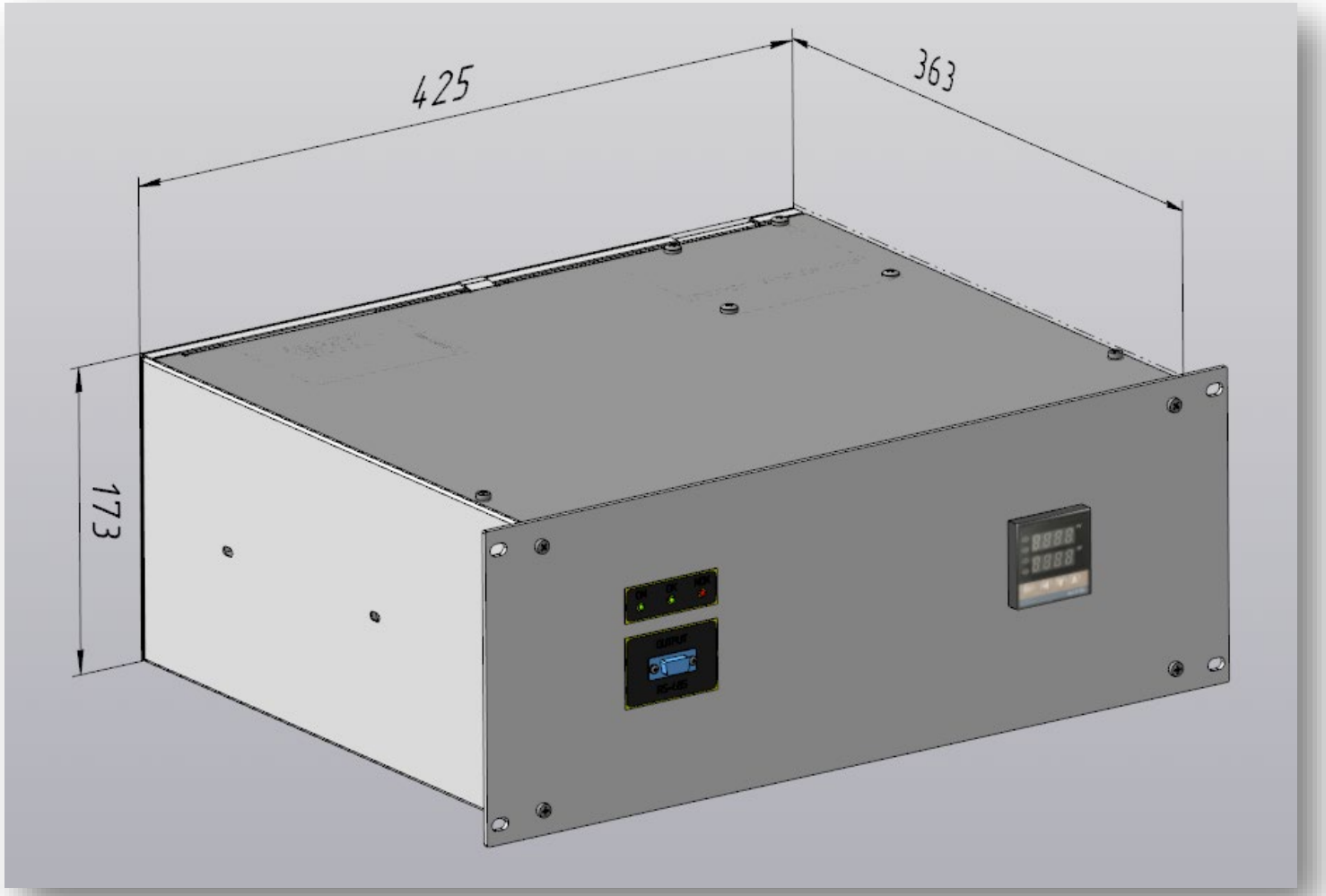
POLARIS 2011(.D).CH_4

POLARIS 2015(.D).CO

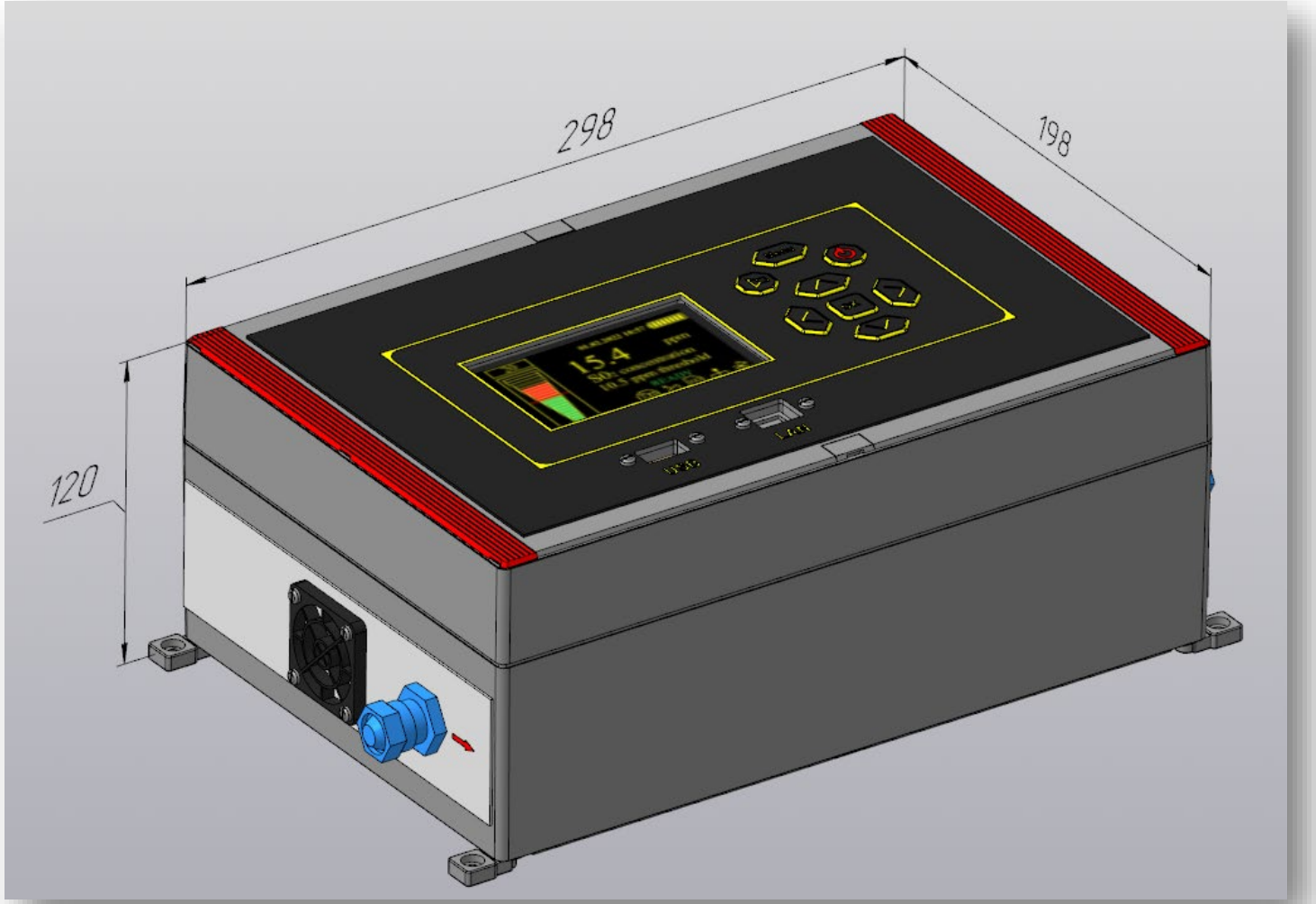
Continuous Gas Analyzers
POLARIS-ECO 301X.D (hot probe)
general view

Continuous Gas Analyzers
POLARIS-ECO 301X.D.NO_2 (hot probe)
(modification with display and keyboard, general view)

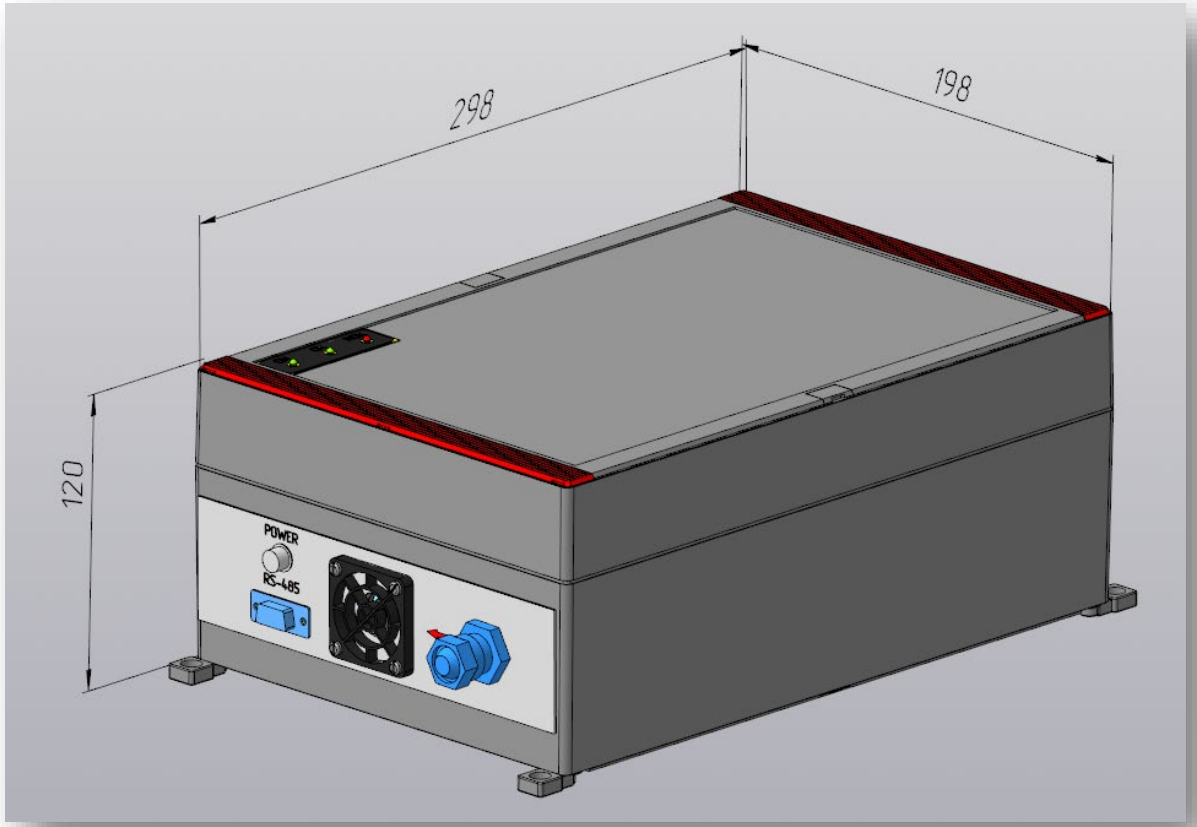
Continuous Gas Analyzers
POLARIS-ECO 301X with output interface RS-485
general view

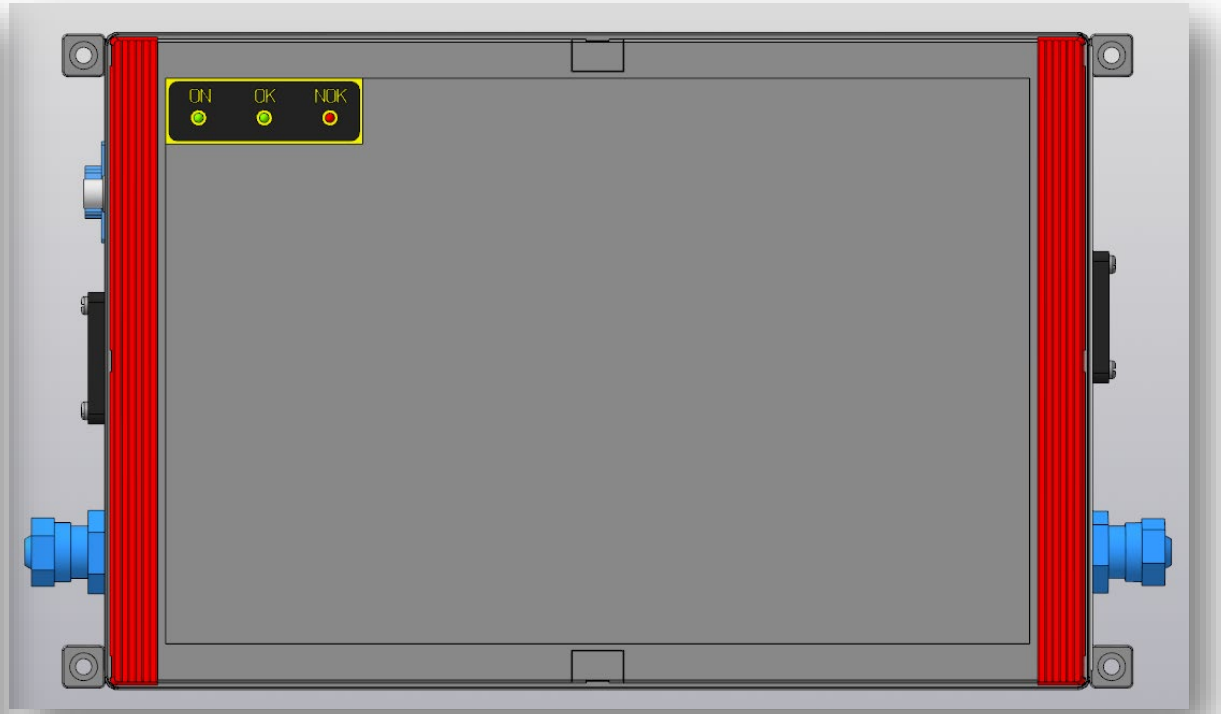


Gas Analyzers
POLARIS 201X (cold probe)
(modification with display and keyboard, general view)



Gas Analyzers
POLARIS 201X (cold probe)
(modification with output interface RS-485, general view)





Hot probe Continuous Gas Analyzers
POLARIS-ECO 301X parameters

- Ambient temperature: 0˚C - +40˚C.
- RH: 10% - 93% (w/o condensation).
- Feed gas temperature:
  Release T1: +170˚C - +190˚C,
  Release T2: +120˚C - +140˚C,
  Release T3: 0˚C - +40˚C.
- Feed gas RH: 10% - 93% (w/o condensation).
- Gas pump: external.
- Rate of external gas supply: 1 - 2 l/min.
- Allowable gas pressure: 84 - 107 kPa.
- 19” ventilated rack-mounting.
- Main supply: AC 110/220 V, 50/60 Hz.
- Consumption power: up to 300 W

POLARIS-ECO 3013(.D).NO_2 parameters

- Gas concentration measurement range:
  0 – 600,0 ppm.
- Gas concentration indication range:
  600 - 6000 ppm.
- Measurement accuracy:
  ±(0,5 + 0,05*C) ppm, where C is a measuring gas concentration.
- Signal rise time $T_{0,9}$:
  30 seconds.
- Display resolution (version 3013.D):
  0,1 ppm.

POLARIS-ECO 3014(.D).SO_2 parameters

- Gas concentration measurement range:
  0 – 500,0 ppm.
- Gas concentration indication range:
  500 - 5000 ppm.
- Measurement accuracy:
  ±(0,35 + 0,05*C) ppm, where C is a measuring gas concentration.
- Signal rise time $T_{0,9}$:
  30 seconds.
- Display resolution (version 3014.D):
  0,1 ppm.

POLARIS-ECO 3015(.D).CO parameters

- Gas concentration measurement range:
  0 – 2000 ppm.
- Gas concentration indication range:
  2000 - 20000 ppm.
- Measurement accuracy:
  ±(2 + 0,05*C) ppm, where C is a measuring gas concentration.
- Signal rise time $T_{0,9}$:
  30 seconds.
- Display resolution (version 3015.D):
  1 ppm.

POLARIS-ECO 3016(.D).NO parameters

- Gas concentration measurement range:
  0 – 800 ppm.
- Gas concentration indication range:
  800 - 6000 ppm.
- Measurement accuracy:
  ±(1 + 0,05*C) ppm, where C is a measuring gas concentration.
- Signal rise time $T_{0,9}$:
  30 seconds.
- Display resolution (version 3016.D):
  1 ppm.

Gas Analyzers
POLARIS 201X (cold probe)
parameters

- Ambient temperature: -20˚C - +40˚C.
- RH: 10% - 93% (w/o condensation).
- Feed gas temperature: -20˚C - +40˚C.
- Feed gas RH: 10% - 93% (w/o condensation).
- Gas pump: external, (internal – option).
- Rate of gas supply: external: 1 - 2 l/min, internal: 0,5 l/min.
- Allowable feed gas pressure: 84 - 107 kPa.
- Main supply variants:
  1. 12 V - 27 V, up to 2,5 A DC and AC 110/220 V, 50/60 Hz, with a adapter,
  2. Option: built-in battery.

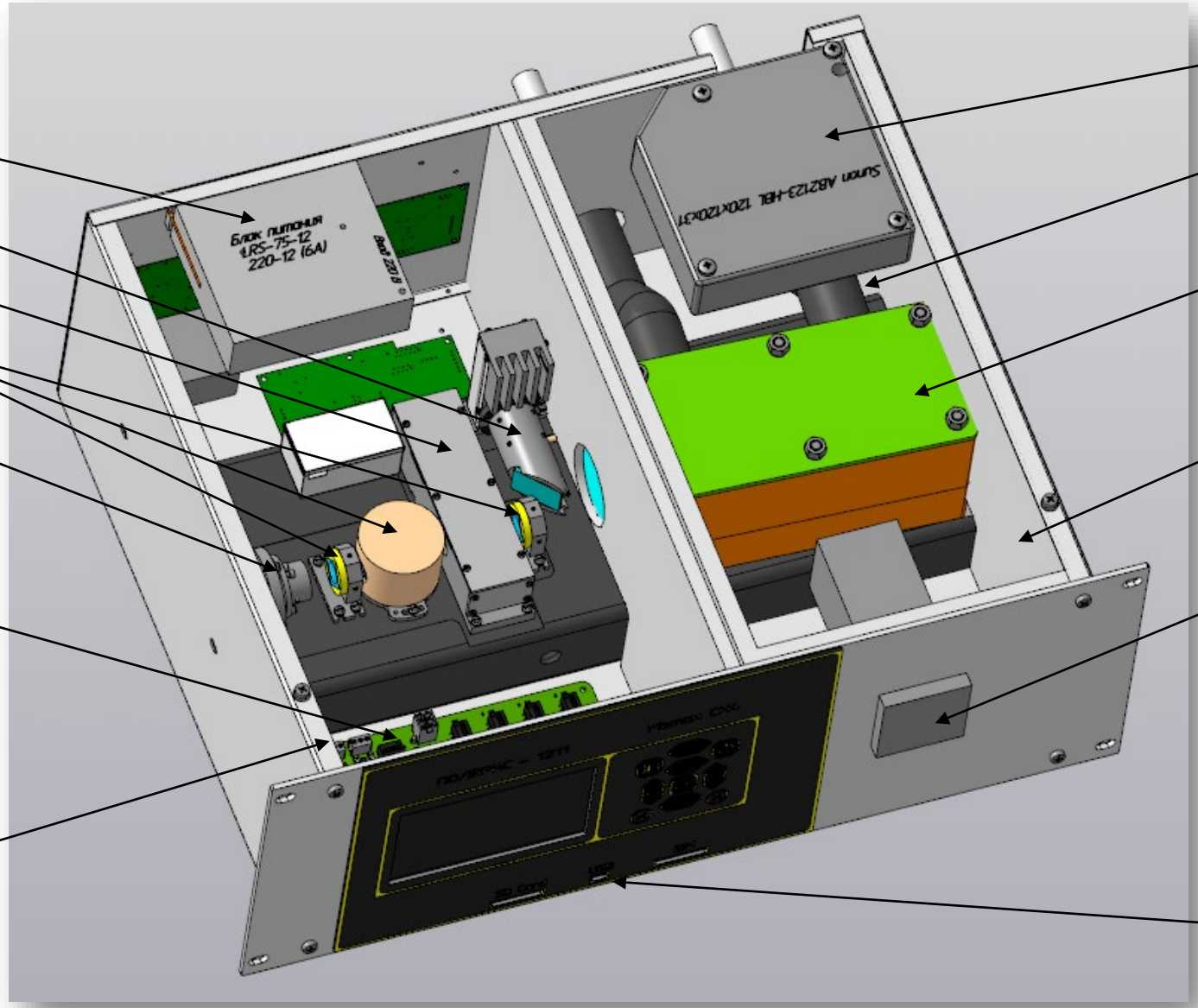
POLARIS 2011(.D).CH_4 parameters

- Gas concentration measurement range:
  0 – 2000 ppm.
- Gas concentration indication range:
  2000 - 10000 ppm.
- Measurement accuracy:
  ±(2,5 + 0,05*C) ppm, where C is a measuring gas concentration.
- Signal rise time $T_{0,9}$:
  0,75 seconds (with external pump flow of 8-12 L/sec).
- Display resolution (version 2011.D):
  0,1 ppm.

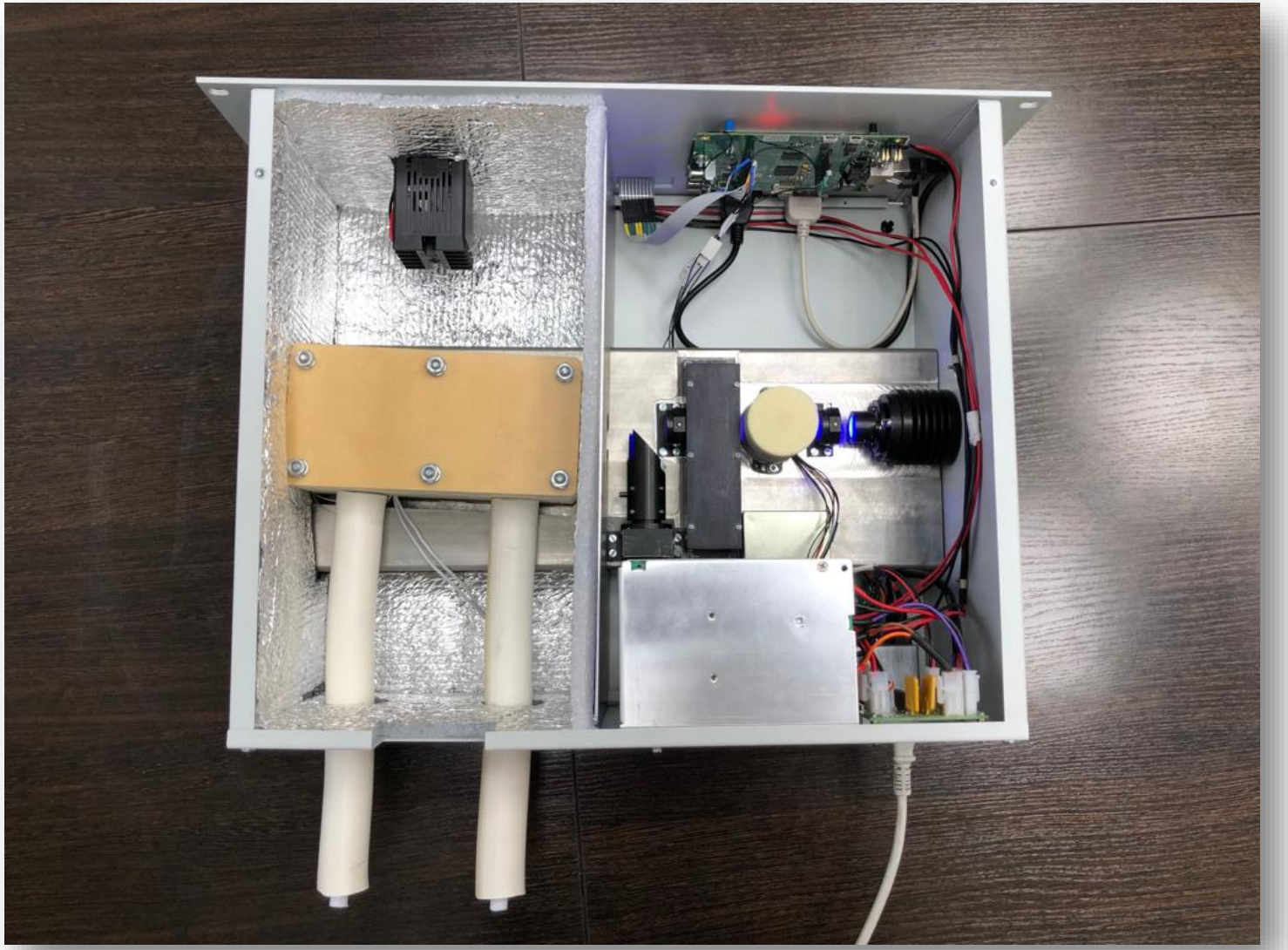
POLARIS 2015(.D).CO parameters

- Gas concentration measurement range:
  0 – 2000 ppm.
- Gas concentration indication range:
  2000 - 20000 ppm.
- Measurement accuracy:
  ±(2 + 0,05*C) ppm, where C is a measuring gas concentration.
- Signal rise time $T_{0,9}$:
  30 seconds.
- Display resolution (version 2015.D):
  1 ppm.

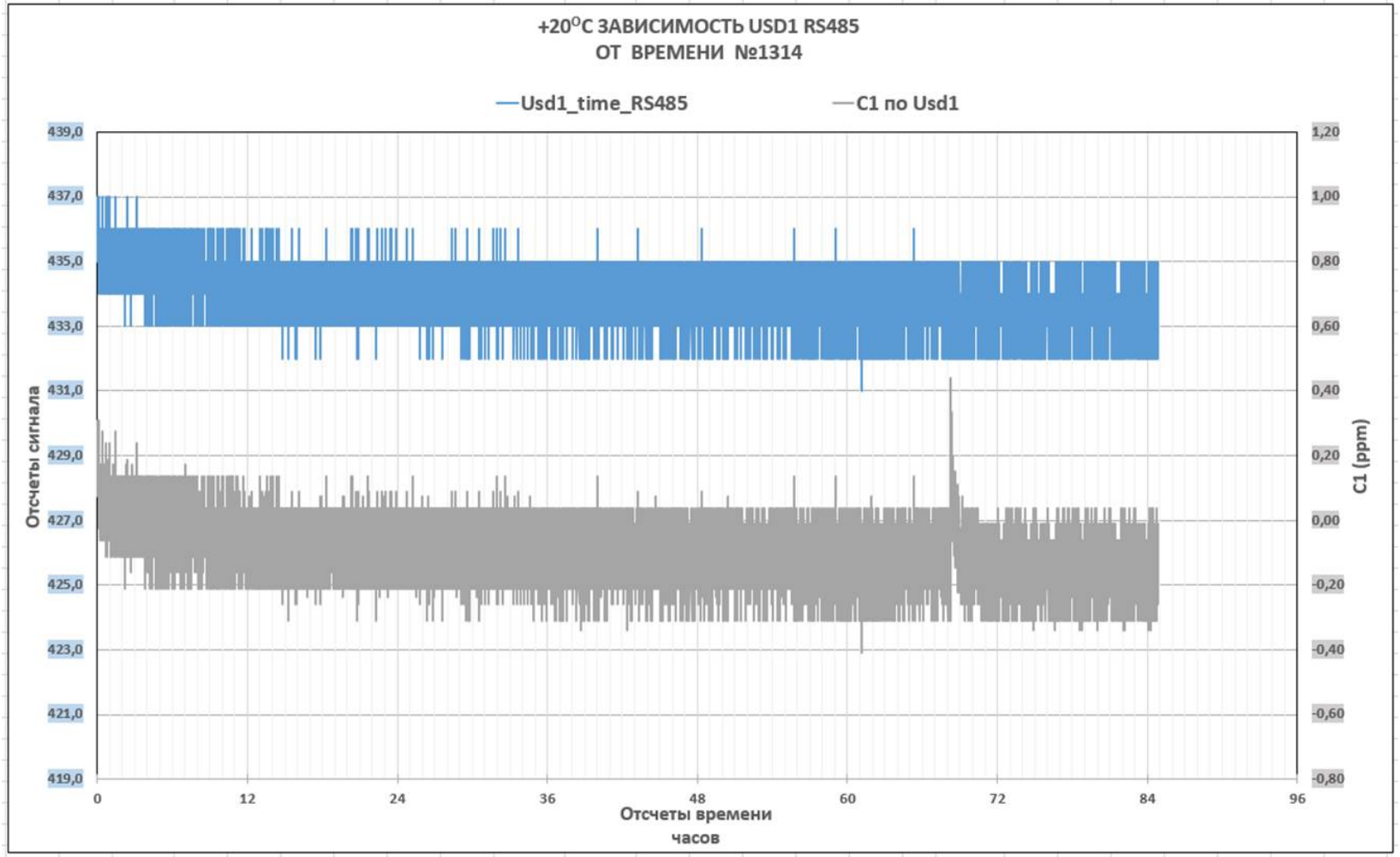
Inner assembly of POLARIS-ECO 301X.D models



POLARIS-ECO 3013.D.NO_2
Inner assembly

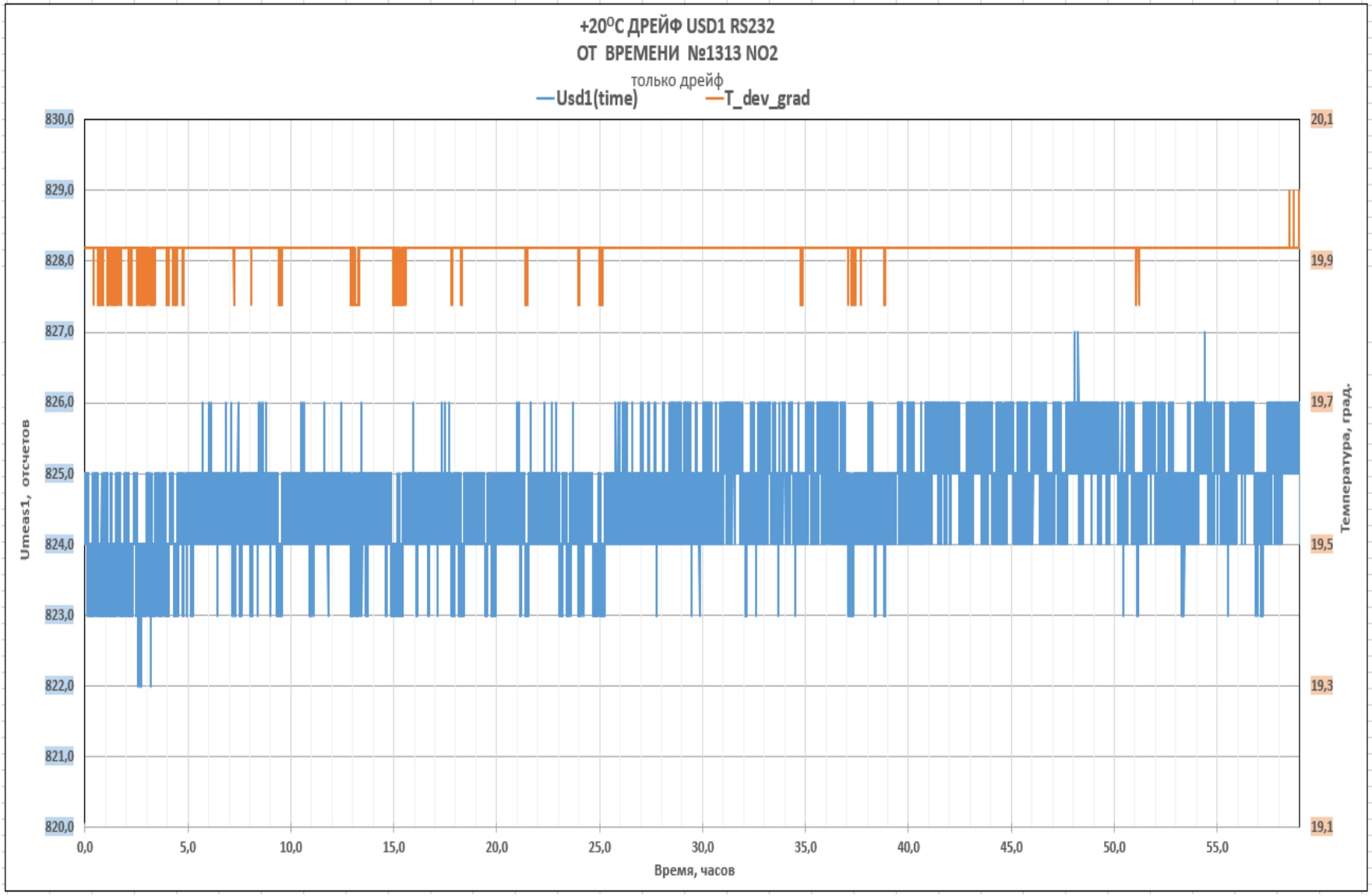


POLARIS-ECO 3014.SO_2 zero drift and noise



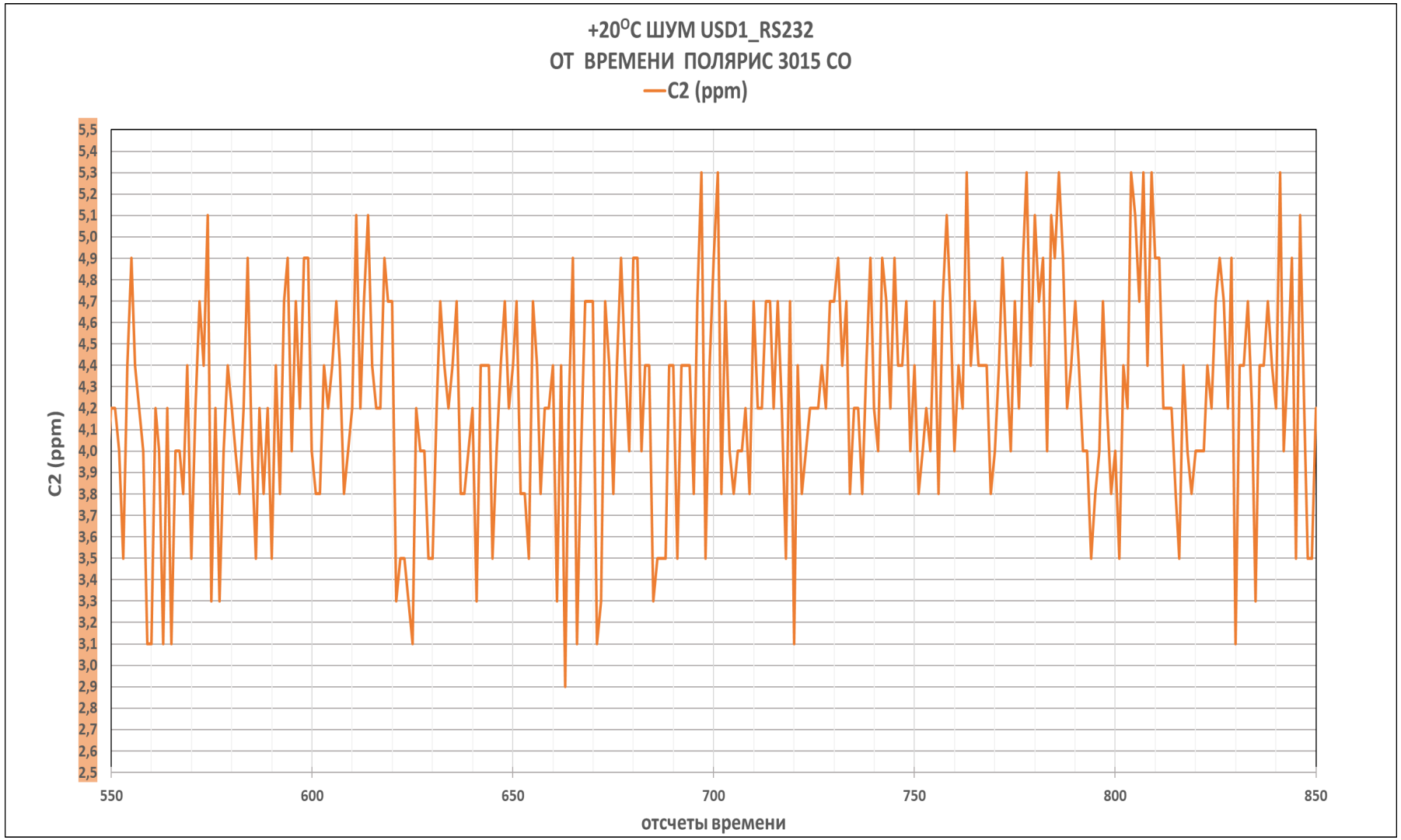
- Zero drift is +/-0,1 ppm in 85 hours
- Noise is 0,35 ppm peak to peak
- Device restarting after 69 hours showed that the complete thermalization of the device ends in 45 minutes
- Primary baseline drop is related to 1500 ppm SO_2 test done before drift test started

POLARIS-ECO 3013.NO_2 zero drift and noise



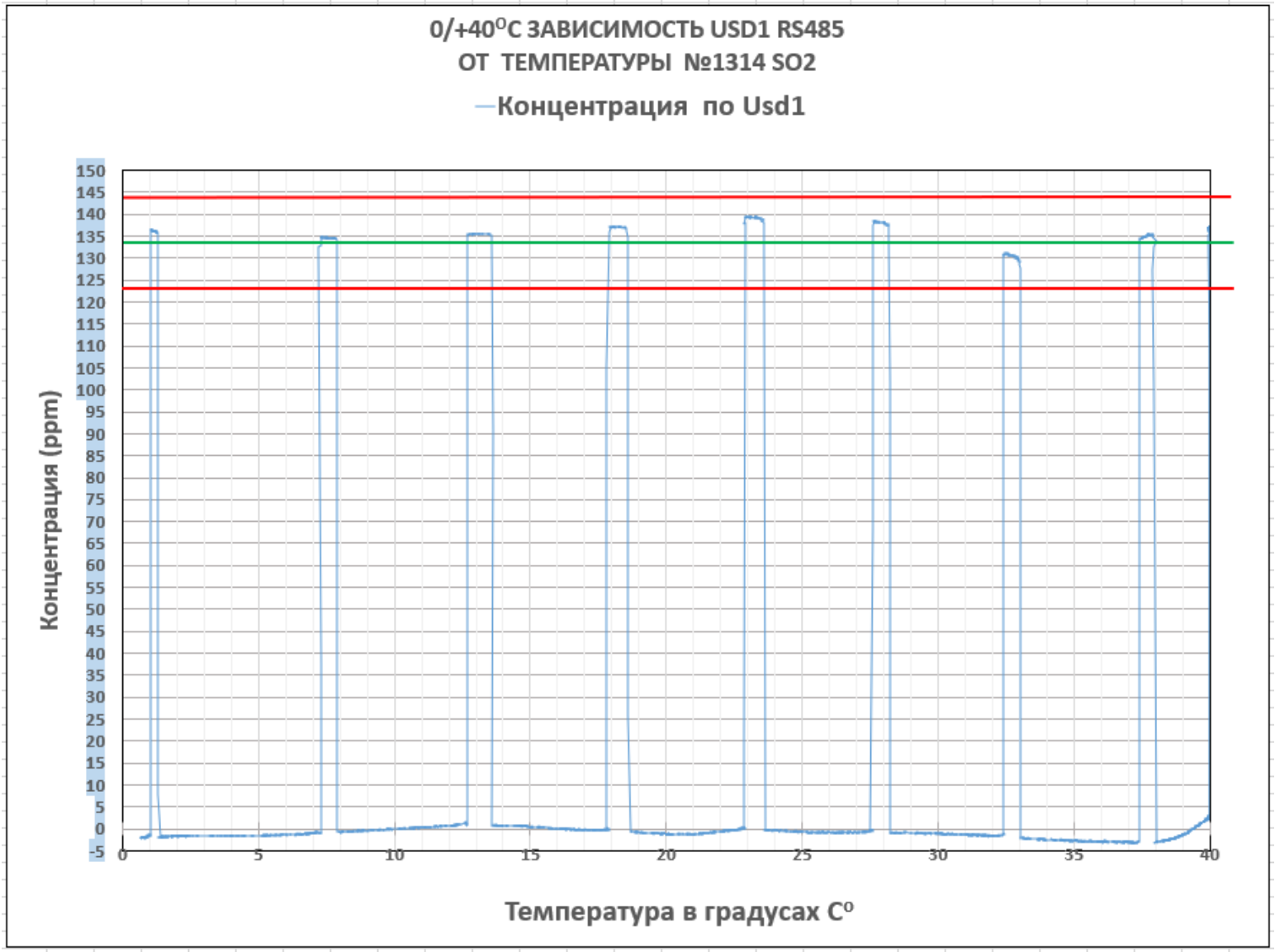
- Gas Detectors sensitivity is 12,6 counts/ppm
- Zero drift is +/-0,12 ppm in 59 hours
- Noise is 0,25 ppm peak to peak

POLARIS-ECO 3015.CO noise



- Noise is 2,4 ppm peak to peak with integration time 0,25 seconds.

POLARIS-ECO 3014.SO_2 gas test with temperature variation



- Thermal zero shift is +/-2 ppm in the range of temperature from 0 to +40°C
- Temperature change of sensitivity is +/-4% in the range of temperature from 0 to +40°C

POLARIS-ECO 3013, 3014, 3015 cross sensitivity to side gas components

Cross sensitivity check for Polaris-3 Heat Test, modifications 1313_NO2, 1313_SO2, 1315_CO

Detector 1314_SO2

Gas supply sequence	Concentration, ppm	Blowing time, min	Flow capacity l/min	Readings, ppm	Readings, mV	Suppression ratio
Nitrogen		15	1,5	-0,098	300	
NO2	2504	5	1,5	-1,096	294	2500
Nitrogen		15	1,5	-0,276	299,5	
CO	1816	5	1,5	-0,308	299,5	>1816
Nitrogen		15	1,5	-0,341	299,5	
CO2	7,72% ??.	5	1,5	-0,422	299,5	7,70E+05
Nitrogen		15	1,5	-0,441	299	
SO2	147	5	1,5	139,5	1210	
SO2	2008	5	1,5	1685	2998	
Nitrogen		15	1,5	-0,474	298,5	
Wet nitrogen	+40% humidity	15	0,5	-0,533	298,5	- 0,05 ppm/40%
Nitrogen		15	1,5	-0,494	298,5	
Air		constantly				
Nitrogen		15	1,5	-0,4	474 readout	
NO	1559 ppm	15	1,5	-0,8	472 readout	>1559
Nitrogen		15	1,5	-0,8	472 readout	

Detector 1313_NO2

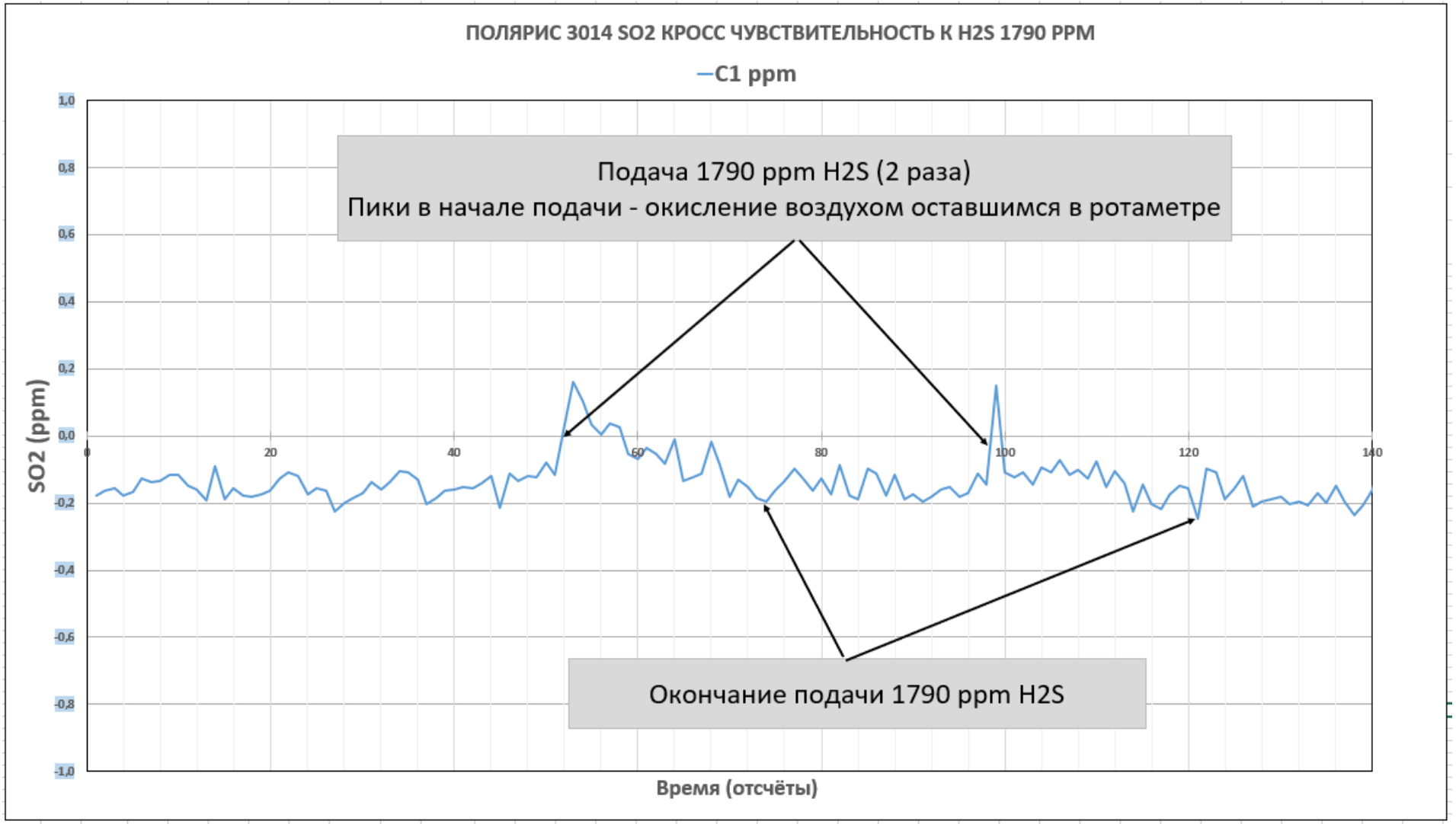
Gas supply sequence	Concentration, ppm	Blowing time, min	Flow capacity, l/min	Readings Usd1, mV	Suppression, ratio
Nitrogen		15	1,5	433	
SO2	2008	5	1,5	436	>2008
Nitrogen		15	1,5	439	
CO	10042	5	1,5	440	>10042
Nitrogen		15	1,5	440	
CO2	7,72% vol.	5	1,5	444	7,70E+05
Nitrogen		15	1,5	444	
NO2	118	5	1,5	1110	
NO2	2500	5	1,5	2998	
Nitrogen		15	1,5	441	
Wet nitrogen	+40% humidity	15	0,5	440	0,0 ppm/40%
Nitrogen		15	1,5	440	
Air		constantly			
Nitrogen		15	1,5	-0,9 ppm	
NO	1559 ppm	15	1,5	30,5 ppm	51*)
Nitrogen		15	1,5	-0,8 ppm	

Detector 1315_CO

Gas supply sequence	Concentration, ppm	Blowing time, min	Flow capacity, l/min	Readings Usd1, mV	Suppression ration
Nitrogen		15	1,5	385-402	
SO2	2008	5	1,5	383-403	>2008
Nitrogen		15	1,5	384-402	
NO2	2504	5	1,5	385-405	>2504
Nitrogen		15	1,5	382-405	
CO2	7,72% ??.	5	1,5	382-402	7,70E+05
Nitrogen		15	1,5	384-404	
CO	244	5	1,5	914-935	
CO	1816	5	1,5	2995	
Nitrogen		15	1,5	382-405	
Wet nitrogen	+40% humidity	15	0,5	381-405	- 0,2 ppm/40%
Nitrogen		15	1,5	384-404	

- *) Presumably, the cylinder with control gas mixture contained the rest of NO2.
  Reverification is planned.

POLARIS-ECO 3014.SO_2 cross sensitivity to H_2S (side gas component)



- Selectivity coefficient – over 10 000.