GX-Force Integration Test Specification (with Results)

Document No.GX-Force_VR006

Approval	Review	Preparation
Name: Engineering Div. 2 Mutou	Name: Engineering Div. 2 Hirao	Name: Engineering Div. 2 Ikarashi
Date 2021/10/1	Date 2021/10/1	Date 2021/9/30

No.	Date	Version	Revised content	Remarks
EX.	20XX/XX/XX	RevX.X	Create New	
1	2021/9/30	Rev1.0	Create New	
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Integration test specification

Test contents and means

・Confirm that the functional specifications are satisfied using the actual product.
Implementation means: Use the GX-Force real machine.
To be implemented :2021/8/17-2021/9/30
Tested hardware version : 6991 6237 10
Tested software version : Main MCU 07244, Sensor MCU 07245

Integration test target module

Request number	Function number	Functional items	Safety items	Date of the last test	Test representative	Test date	Judgment	Results
req[1]	fnc[1-1-1]	NC sensor concentration acquisition	○	2021/8/17	Taki	2021/8/18	Ikarashi	OK
	fnc[1-1-2]	NC sensor temperature correction	○	2021/8/17	Taki	2021/8/18	Ikarashi	OK
	fnc[1-1-3]	NC sensor humidity correction	○	2021/8/17	Taki	2021/8/18	Ikarashi	OK
	fnc[1-1-4]	NC sensor full scale	○	2021/8/17	Taki	2021/8/18	Ikarashi	OK
	fnc[1-1-5]	NC sensor negative	○	2021/8/17	Taki	2021/8/18	Ikarashi	OK
	fnc[1-1-6]	NC sensor intermittent operation	○	2021/8/17	Taki	2021/8/18	Ikarashi	OK
	fnc[1-1-7]	NC sensor sensor protection	○	2021/8/17	Taki	2021/8/18	Ikarashi	OK
	fnc[1-2-1]	EC sensor concentration acquisition	○	2021/8/18	Taki	2021/8/19	Ikarashi	OK
	fnc[1-2-2]	EC sensor temperature correction	○	2021/8/18	Taki	2021/8/19	Ikarashi	OK
	fnc[1-2-3]	EC sensor full scale	○	2021/8/18	Taki	2021/8/19	Ikarashi	OK
	fnc[1-2-4]	EC sensor negative	○	2021/8/18	Taki	2021/8/19	Ikarashi	OK
	fnc[1-2-5]	Correction for sudden O2 sensor pressure change	○	2021/8/18	Taki	2021/8/19	Ikarashi	OK
	fnc[1-3-1]	Calibration curve processing	○	2021/8/19	Taki	2021/8/20	Ikarashi	OK
	fnc[1-3-2]	Reverse calibration curve processing	○	2021/8/19	Taki	2021/8/20	Ikarashi	OK
	fnc[1-4-1]	Zero tracking processing	×	2021/8/19	Taki	2021/8/20	Ikarashi	OK
	fnc[1-5-1]	Smoothing process	×	2021/8/19	Taki	2021/8/20	Ikarashi	OK
	fnc[1-5-2]	Cutoff processing	×	2021/8/19	Taki	2021/8/20	Ikarashi	OK
	fnc[1-6-1]	Peak value acquisition	×	2021/8/19	Taki	2021/8/20	Ikarashi	OK
	fnc[1-7-1]	Peak value display	×	2021/8/19	Taki	2021/8/20	Ikarashi	OK
	fnc[1-8-1]	Peak value reset	×	2021/8/19	Taki	2021/8/20	Ikarashi	OK
	fnc[1-9-1]	Average value acquisition	○	2021/8/20	Taki	2021/8/23	Ikarashi	OK
	fnc[1-10-1]	STEL value acquisition	○	2021/8/20	Taki	2021/8/23	Ikarashi	OK
	fnc[1-11-1]	STEL value display	×	2021/8/20	Taki	2021/8/23	Ikarashi	OK
	fnc[1-12-1]	TWA value acquisition	○	2021/8/20	Taki	2021/8/23	Ikarashi	OK
	fnc[1-13-1]	TWA value display	×	2021/8/20	Taki	2021/8/23	Ikarashi	OK
	fnc[1-14-1]	Cumulative value acquisition	○	2021/8/20	Taki	2021/8/23	Ikarashi	OK
	fnc[1-15-1]	Cumulative value display	×	2021/8/20	Taki	2021/8/23	Ikarashi	OK
req[2]	fnc[2-1-1]	Gas alarm latchinging operation	○	2021/8/23	Taki	2021/8/24	Ikarashi	OK
	fnc[2-1-2]	Gas alarm auto reset operation	○	2021/8/23	Taki	2021/8/24	Ikarashi	OK
	fnc[2-1-3]	Gas alarm display	○	2021/8/23	Taki	2021/8/24	Ikarashi	OK
	fnc[2-1-4]	Gas alarm reset	○	2021/8/23	Taki	2021/8/24	Ikarashi	OK
	fnc[2-1-5]	Gas warning notification processing	○	2021/8/23	Taki	2021/8/24	Ikarashi	OK
	fnc[2-2-1]	Alarm point setting	×	2021/8/24	Taki	2021/8/25	Ikarashi	OK
	fnc[2-3-1]	Gas alarm latching/automatic reset setting	×	2021/8/24	Taki	2021/8/25	Ikarashi	OK
	fnc[2-4-1]	TWA alarm/cumulative alarm setting	×	2021/8/24	Taki	2021/8/25	Ikarashi	OK
	fnc[2-5-1]	All gas alarm OFF setting	×	2021/8/24	Taki	2021/8/25	Ikarashi	OK
	fnc[2-6-1]	Alarm silence setting	×	2021/8/24	Taki	2021/8/25	Ikarashi	OK
req[3]	fnc[3-1-1]	Fault alarm latching operation	○	2021/8/25	Taki	2021/8/26	Ikarashi	OK
	fnc[3-1-2]	Fault alarm display	○	2021/8/25	Taki	2021/8/26	Ikarashi	OK
	fnc[3-1-3]	Fault USB communication	○	2021/8/25	Taki	2021/8/26	Ikarashi	OK
	fnc[3-1-4]	Fault detail display	○	2021/8/25	Taki	2021/8/26	Ikarashi	OK
	fnc[3-1-5]	Fault alarm reset	○	2021/8/25	Taki	2021/8/26	Ikarashi	OK
	fnc[3-2-1]	System check	○	2021/8/26	Taki	2021/8/27	Ikarashi	OK
	fnc[3-2-2]	Internal clock check	○	2021/8/26	Taki	2021/8/27	Ikarashi	OK
	fnc[3-2-3]	Circuit voltage check	○	2021/8/26	Taki	2021/8/27	Ikarashi	OK
	fnc[3-2-4]	Thermistor error check	○	2021/8/26	Taki	2021/8/27	Ikarashi	OK
	fnc[3-2-5]	Sensor error check	○	2021/8/26	Taki	2021/8/27	Ikarashi	OK
	fnc[3-2-6]	EC connection check	○	2021/8/26	Taki	2021/8/27	Ikarashi	OK
	fnc[3-2-7]	Battery voltage drop check	○	2021/8/26	Taki	2021/8/27	Ikarashi	OK
	fnc[3-2-8]	Sensor circuit error check	○	2021/8/26	Taki	2021/8/27	Ikarashi	OK
	fnc[3-2-9]	Flow error check	○	2021/8/26	Taki	2021/8/27	Ikarashi	OK
	fnc[3-2-10]	Pump error check	○	2021/8/26	Taki	2021/8/27	Ikarashi	OK
req[4]	fnc[4-1-1]	BUMP test	×	2021/8/27	Taki	2021/8/30	Ikarashi	OK
	fnc[4-1-2]	BUMP calibration	×	2021/8/27	Taki	2021/8/30	Ikarashi	OK
	fnc[4-1-3]	BUMP calibration ON/OFF setting	×	2021/8/27	Taki	2021/8/30	Ikarashi	OK
	fnc[4-1-4]	BUMP condition setting	×	2021/8/27	Taki	2021/8/30	Ikarashi	OK
	fnc[4-1-5]	BUMP failure alarm reset	×	2021/8/27	Taki	2021/8/30	Ikarashi	OK
	fnc[4-2-1]	Gas alarm test	×	2021/8/27	Taki	2021/8/30	Ikarashi	OK
req[5]	fnc[5-1-1]	Air calibration	×	2021/8/30	Taki	2021/8/31	Ikarashi	OK
	fnc[5-1-2]	Air calibration error display	×	2021/8/30	Taki	2021/8/31	Ikarashi	OK
	fnc[5-2-1]	Demand zero calibration	×	2021/8/30	Taki	2021/8/31	Ikarashi	OK
	fnc[5-2-2]	Demand zero calibration ON/OFF setting	×	2021/8/30	Taki	2021/8/31	Ikarashi	OK
	fnc[5-2-3]	Demand zero calibration error display	×	2021/8/30	Taki	2021/8/31	Ikarashi	OK
	fnc[5-3-1]	Auto zero calibration	×	2021/8/30	Taki	2021/8/31	Ikarashi	OK
	fnc[5-3-2]	Auto zero calibration ON/OFF setting	×	2021/8/30	Taki	2021/8/31	Ikarashi	OK
	fnc[5-3-3]	Auto zero calibration error display	×	2021/8/30	Taki	2021/8/31	Ikarashi	OK
	fnc[5-4-1]	Auto calibration	×	2021/8/30	Taki	2021/8/31	Ikarashi	OK
	fnc[5-4-2]	Auto calibration concentration value setting	×	2021/8/30	Taki	2021/8/31	Ikarashi	OK
	fnc[5-4-3]	Auto calibration execution gas selection	×	2021/8/30	Taki	2021/8/31	Ikarashi	OK
	fnc[5-4-4]	Auto calibration error diagnosis	×	2021/8/30	Taki	2021/8/31	Ikarashi	OK
	fnc[5-5-1]	Calibration expiration check during initialization	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-5-2]	Operation setting on calibration expiration	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-5-3]	Operation processing on calibration expiration	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-5-4]	Calibration expiration display	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-5-5]	Calibration expiration display ON/OFF	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-5-6]	Calibration expiration date setting	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-6-1]	Initial time BUMP Expiration Check	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-6-2]	BUMP expiration check during initialization	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-6-3]	Operation setting on BUMP expiration	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-6-4]	Bump expiration display	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-6-5]	BUMP expiration display ON/OFF setting	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-6-6]	BUMP expiration date setting	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-7-1]	Maintenance expiration check during initialization	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-7-2]	Operation setting on maintenance expiration	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK

	fnc[5-7-3]	Operation processing on maintenance expiration	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-7-4]	Maintenance expiration display	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-7-5]	Maintenance expiration display ON/OFF setting	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-7-6]	Maintenance expiration date setting	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-8-1]	Sensor combination setting	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-8-2]	Sensor ON/OFF setting	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-8-3]	Measurement gas selection setting	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-8-4]	Zero tracking ON/OFF setting	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
	fnc[5-8-5]	Suppress ON/OFF setting	×	2021/8/31	Taki	2021/9/1	Ikarashi	OK
req[6]	fnc[6-1-1]	Manual backlight processing	×	2021/9/1	Taki	2021/9/2	Ikarashi	OK
	fnc[6-1-2]	Manual backlight setting	×	2021/9/1	Taki	2021/9/2	Ikarashi	OK
	fnc[6-2-1]	Key operation sound processing	×	2021/9/1	Taki	2021/9/2	Ikarashi	OK
	fnc[6-2-2]	Key operation sound ON/OFF setting	×	2021/9/1	Taki	2021/9/2	Ikarashi	OK
	fnc[6-3-1]	Confirmation beep processing	×	2021/9/1	Taki	2021/9/2	Ikarashi	OK
	fnc[6-3-2]	Confirmation beep ON/OFF setting	×	2021/9/1	Taki	2021/9/2	Ikarashi	OK
	fnc[6-4-1]	Lunch break ON/OFF setting	×	2021/9/1	Taki	2021/9/2	Ikarashi	OK
	fnc[6-4-2]	Lunch break record during power is off	×	2021/9/1	Taki	2021/9/2	Ikarashi	OK
	fnc[6-4-3]	Resume selection	×	2021/9/1	Taki	2021/9/2	Ikarashi	OK
	fnc[6-4-4]	Resume processing	×	2021/9/1	Taki	2021/9/2	Ikarashi	OK
	fnc[6-5-1]	ID display ON/OFF setting	×	2021/9/1	Taki	2021/9/2	Ikarashi	OK
	fnc[6-5-2]	Station ID setting	×	2021/9/1	Taki	2021/9/2	Ikarashi	OK
	fnc[6-5-3]	User ID setting	×	2021/9/1	Taki	2021/9/2	Ikarashi	OK
	fnc[6-6-1]	Memory initialization	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-6-2]	Initialization of logger data	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-7-1]	Protection setting for non-administrator	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-8-1]	User mode password authentication	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-8-2]	User mode security ON/OFF setting	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-8-3]	Maintenance mode password authentication	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-8-4]	Maintenance mode security ON/OFF setting	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-8-5]	Gas select mode password authentication	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-8-6]	Factory mode password authentication	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-9-1]	Power OFF execution confirmation password	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-9-2]	Demand zero execution confirmation password authentication	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-9-3]	Alarm reset execution confirmation password	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-10-1]	Factory setting record	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-10-2]	Factory setting read	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-10-3]	Serial number input	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-10-4]	Temporary serial number input	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-10-5]	SPE number input	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-10-6]	Destination setting	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-11-1]	Power supply activation processing	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
	fnc[6-11-2]	Power supply stop processing	×	2021/9/2	Taki	2021/9/3	Ikarashi	OK
req[7]	fnc[7-1-1]	Communication processing	×	2021/9/3	Taki	2021/9/6	Ikarashi	OK
	fnc[7-1-2]	Program rewrite	×	2021/9/3	Taki	2021/9/6	Ikarashi	OK
req[8]	fnc[8-1-1]	Power logging	×	2021/9/6	Taki	2021/9/7	Ikarashi	OK
	fnc[8-1-2]	Interval trend record	×	2021/9/6	Taki	2021/9/7	Ikarashi	OK
	fnc[8-1-3]	Alarm trend record	×	2021/9/6	Taki	2021/9/7	Ikarashi	OK
	fnc[8-1-4]	Alarm event recording	×	2021/9/6	Taki	2021/9/7	Ikarashi	OK
	fnc[8-1-5]	Fault event recording	×	2021/9/6	Taki	2021/9/7	Ikarashi	OK
	fnc[8-1-6]	Calibration history record	×	2021/9/6	Taki	2021/9/7	Ikarashi	OK
	fnc[8-1-7]	Setting change history recording	×	2021/9/6	Taki	2021/9/7	Ikarashi	OK
	fnc[8-1-8]	Snap logging	×	2021/9/6	Taki	2021/9/7	Ikarashi	OK
	fnc[8-1-9]	Logger area write test	×	2021/9/7	Taki	2021/9/8	Ikarashi	OK
	fnc[8-2-1]	Data log clear	×	2021/9/7	Taki	2021/9/8	Ikarashi	OK
	fnc[8-2-2]	Power log clear	×	2021/9/7	Taki	2021/9/8	Ikarashi	OK
	fnc[8-3-1]	Detailed fault log record	×	2021/9/7	Taki	2021/9/8	Ikarashi	OK
	fnc[8-4-1]	Logger overwrite	×	2021/9/7	Taki	2021/9/8	Ikarashi	OK
	fnc[8-4-2]	Logger overwrite ON/OFF setting	×	2021/9/7	Taki	2021/9/8	Ikarashi	OK
	fnc[8-5-1]	Set interval trend time	×	2021/9/7	Taki	2021/9/8	Ikarashi	OK
	fnc[8-6-1]	User ID record	×	2021/9/7	Taki	2021/9/8	Ikarashi	OK
	fnc[8-7-1]	Station ID record	×	2021/9/7	Taki	2021/9/8	Ikarashi	OK
req[9]	fnc[9-1-1]	Measurement mode	×	2021/9/8	Taki	2021/9/9	Ikarashi	OK
	fnc[9-1-2]	All gas types concentration dispay during measurement	×	2021/9/8	Taki	2021/9/9	Ikarashi	OK
	fnc[9-2-1]	Display mode operation transition	×	2021/9/8	Taki	2021/9/9	Ikarashi	OK
	fnc[9-2-2]	Display mode reset exit	×	2021/9/8	Taki	2021/9/9	Ikarashi	OK
	fnc[9-2-3]	Display mode 20 seconds exit	×	2021/9/8	Taki	2021/9/9	Ikarashi	OK
	fnc[9-3-1]	User mode	×	2021/9/8	Taki	2021/9/9	Ikarashi	OK
	fnc[9-4-1]	Maintenance mode	×	2021/9/8	Taki	2021/9/9	Ikarashi	OK
	fnc[9-5-1]	Gas select mode	×	2021/9/8	Taki	2021/9/9	Ikarashi	OK
	fnc[9-6-1]	Factory mode	×	2021/9/8	Taki	2021/9/9	Ikarashi	OK
	fnc[9-7-1]	Communication mode	×	2021/9/8	Taki	2021/9/9	Ikarashi	OK
	fnc[9-7-2]	SDM communication mode	×	2021/9/8	Taki	2021/9/9	Ikarashi	OK
	fnc[9-8-1]	Initial mode	×	2021/9/8	Taki	2021/9/9	Ikarashi	OK
	fnc[9-9-1]	Mode transition	×	2021/9/8	Taki	2021/9/9	Ikarashi	OK
req[10]	fnc[10-1-1]	All lights on initialization	×	2021/9/9	Taki	2021/9/10	Ikarashi	OK
	fnc[10-2-1]	Gas name display on initialization	×	2021/9/9	Taki	2021/9/10	Ikarashi	OK
	fnc[10-2-2]	Full scale display on initialization	×	2021/9/9	Taki	2021/9/10	Ikarashi	OK
	fnc[10-2-3]	Latcing/Auto resety setting display on initialization	×	2021/9/9	Taki	2021/9/10	Ikarashi	OK
	fnc[10-2-4]	Alarm display on initialization	×	2021/9/9	Taki	2021/9/10	Ikarashi	OK
	fnc[10-2-5]	Alarm point display on display mode	×	2021/9/9	Taki	2021/9/10	Ikarashi	OK
	fnc[10-3-1]	Date and time display on initialization	×	2021/9/9	Taki	2021/9/10	Ikarashi	OK
	fnc[10-3-2]	Time display during measurement	×	2021/9/9	Taki	2021/9/10	Ikarashi	OK
	fnc[10-3-3]	Date and time display in display mode	×	2021/9/9	Taki	2021/9/10	Ikarashi	OK
	fnc[10-3-4]	Date and time setting	×	2021/9/9	Taki	2021/9/10	Ikarashi	OK
	fnc[10-4-1]	Battery voltage acquisition	×	2021/9/10	Taki	2021/9/13	Ikarashi	OK
	fnc[10-4-2]	Battery voltage display on initialization	×	2021/9/10	Taki	2021/9/13	Ikarashi	OK
	fnc[10-4-3]	Battery level acquisition	×	2021/9/10	Taki	2021/9/13	Ikarashi	OK
	fnc[10-4-4]	Battery level icon display	×	2021/9/10	Taki	2021/9/13	Ikarashi	OK
	fnc[10-5-1]	ROM number display	×	2021/9/10	Taki	2021/9/13	Ikarashi	OK
	fnc[10-5-2]	SUM number display	×	2021/9/10	Taki	2021/9/13	Ikarashi	OK
	fnc[10-5-3]	SUM value acquisition	×	2021/9/10	Taki	2021/9/13	Ikarashi	OK
	fnc[10-5-4]	Version number display	×	2021/9/10	Taki	2021/9/13	Ikarashi	OK
	fnc[10-6-1]	Station ID display	×	2021/9/10	Taki	2021/9/13	Ikarashi	OK
	fnc[10-6-2]	User ID display	×	2021/9/10	Taki	2021/9/13	Ikarashi	OK
	fnc[10-7-1]	A/D value display	×	2021/9/10	Taki	2021/9/13	Ikarashi	OK
req[11]	fnc[11-1-1]	Temperature value display	×	2021/9/13	Taki	2021/9/14	Ikarashi	OK
	fnc[11-1-2]	Out of range used temperature warning	×	2021/9/13	Taki	2021/9/14	Ikarashi	OK
	fnc[11-2-1]	Long energy operation	×	2021/9/13	Taki	2021/9/14	Ikarashi	OK
	fnc[11-2-2]	Long energy setting	×	2021/9/13	Taki	2021/9/14	Ikarashi	OK
	fnc[11-2-3]	Long energy display	×	2021/9/13	Taki	2021/9/14	Ikarashi	OK

	fnc[11-3-1]	Sensor life acquisition	×	2021/9/14	Taki	2021/9/15	Ikarashi	OK
	fnc[11-3-2]	Sensor life indication	×	2021/9/14	Taki	2021/9/15	Ikarashi	OK
	fnc[11-3-3]	Sensor life display ON/OFF setting	×	2021/9/14	Taki	2021/9/15	Ikarashi	OK
	fnc[11-4-1]	Stealth operation	×	2021/9/14	Taki	2021/9/15	Ikarashi	OK
	fnc[11-4-2]	Stealth mode ON/OFF setting	×	2021/9/14	Taki	2021/9/15	Ikarashi	OK
	fnc[11-5-1]	Combustible gas type conversion operation	×	2021/9/15	Taki	2021/9/16	Ikarashi	OK
	fnc[11-5-2]	Combustible gas type conversion settings	×	2021/9/15	Taki	2021/9/16	Ikarashi	OK
	fnc[11-5-3]	Combustible gas type conversion gas name display	×	2021/9/15	Taki	2021/9/16	Ikarashi	OK
	fnc[11-6-1]	Combustible gas LEL value switching operation	×	2021/9/15	Taki	2021/9/16	Ikarashi	OK
	fnc[11-6-2]	Combustible gas LEL value switching setting	×	2021/9/15	Taki	2021/9/16	Ikarashi	OK
	fnc[11-7-1]	Calibration record display	×	2021/9/15	Taki	2021/9/16	Ikarashi	OK
	fnc[11-8-1]	BUMP record display	×	2021/9/15	Taki	2021/9/16	Ikarashi	OK
	fnc[11-9-1]	Gas alarm point reset processing	×	2021/9/15	Taki	2021/9/16	Ikarashi	OK
	fnc[11-9-2]	Alarm point setting record for gas alarm point reset	×	2021/9/15	Taki	2021/9/16	Ikarashi	OK
req[12]	fnc[12-1-1]	Gas test display	×	2021/9/16	Taki	2021/9/17	Ikarashi	OK
	fnc[12-2-1]	Sensor replacement date and time display	×	2021/9/16	Taki	2021/9/17	Ikarashi	OK
	fnc[12-2-2]	Sensor replacement date and time setting	×	2021/9/16	Taki	2021/9/17	Ikarashi	OK
req[13]	fnc[13-1-1]	IO setting	×	2021/9/17	Taki	2021/9/21	Ikarashi	OK
	fnc[13-2-1]	ROMSUM acquisition	×	2021/9/17	Taki	2021/9/21	Ikarashi	OK
	fnc[13-3-1]	RAM initialization	×	2021/9/17	Taki	2021/9/21	Ikarashi	OK
	fnc[13-3-2]	RAM check	×	2021/9/17	Taki	2021/9/21	Ikarashi	OK
	fnc[13-4-1]	Interrupt function	×	2021/9/21	Taki	2021/9/22	Ikarashi	OK
	fnc[13-4-2]	Task processing	×	2021/9/21	Taki	2021/9/22	Ikarashi	OK
	fnc[13-5-1]	PWM function	×	2021/9/21	Taki	2021/9/22	Ikarashi	OK
	fnc[13-6-1]	A/D setting	○	2021/9/21	Taki	2021/9/22	Ikarashi	OK
	fnc[13-6-2]	A/D reading	○	2021/9/21	Taki	2021/9/22	Ikarashi	OK
	fnc[13-7-1]	UART setting	×	2021/9/22	Taki	2021/9/24	Ikarashi	OK
	fnc[13-7-2]	UART transmission	×	2021/9/22	Taki	2021/9/24	Ikarashi	OK
	fnc[13-7-3]	UART reception	×	2021/9/22	Taki	2021/9/24	Ikarashi	OK
	fnc[13-8-1]	SPI setting	×	2021/9/22	Taki	2021/9/24	Ikarashi	OK
	fnc[13-8-2]	SPI transmission	×	2021/9/22	Taki	2021/9/24	Ikarashi	OK
	fnc[13-8-3]	SPI reception	×	2021/9/22	Taki	2021/9/24	Ikarashi	OK
	fnc[13-9-1]	I2C setting	×	2021/9/22	Taki	2021/9/24	Ikarashi	OK
	fnc[13-9-2]	I2C transmission	×	2021/9/22	Taki	2021/9/24	Ikarashi	OK
	fnc[13-9-3]	I2C reception	×	2021/9/22	Taki	2021/9/24	Ikarashi	OK
	fnc[13-10-1]	WDT setting	×	2021/9/24	Taki	2021/9/27	Ikarashi	OK
	fnc[13-10-2]	WDT cycle reset	×	2021/9/24	Taki	2021/9/27	Ikarashi	OK
	fnc[13-11-1]	Data processing	×	2021/9/24	Taki	2021/9/27	Ikarashi	OK
	fnc[13-12-1]	Setting processing	×	2021/9/24	Taki	2021/9/27	Ikarashi	OK
	fnc[13-13-1]	MCU power supply voltage monitoring	×	2021/9/24	Taki	2021/9/27	Ikarashi	OK
	fnc[13-14-1]	DAC function	×	2021/9/24	Taki	2021/9/27	Ikarashi	OK
req[14]	fnc[14-1-1]	FRAM reading	×	2021/9/27	Taki	2021/9/28	Ikarashi	OK
	fnc[14-1-2]	FRAM write	×	2021/9/27	Taki	2021/9/28	Ikarashi	OK
	fnc[14-1-3]	FRAMSUM acquisition	×	2021/9/27	Taki	2021/9/28	Ikarashi	OK
	fnc[14-2-1]	Read FLASH	×	2021/9/27	Taki	2021/9/28	Ikarashi	OK
	fnc[14-2-2]	Write FLASH	×	2021/9/27	Taki	2021/9/28	Ikarashi	OK
	fnc[14-3-1]	RTC setting	×	2021/9/28	Taki	2021/9/29	Ikarashi	OK
	fnc[14-3-2]	RTC date and time input	×	2021/9/28	Taki	2021/9/29	Ikarashi	OK
	fnc[14-3-3]	RTC date and time output	×	2021/9/28	Taki	2021/9/29	Ikarashi	OK
	fnc[14-4-1]	USB setting	×	2021/9/28	Taki	2021/9/29	Ikarashi	OK
	fnc[14-4-2]	USB data transmission	×	2021/9/28	Taki	2021/9/29	Ikarashi	OK
	fnc[14-4-3]	USB data reception	×	2021/9/28	Taki	2021/9/29	Ikarashi	OK
	fnc[14-5-1]	LCD setting	×	2021/9/28	Taki	2021/9/29	Ikarashi	OK
	fnc[14-5-2]	LCD display data creation	×	2021/9/28	Taki	2021/9/29	Ikarashi	OK
	fnc[14-5-3]	LCD display data transmission	×	2021/9/28	Taki	2021/9/29	Ikarashi	OK
	fnc[14-6-1]	LED control	×	2021/9/28	Taki	2021/9/29	Ikarashi	OK
	fnc[14-7-1]	Light control	×	2021/9/28	Taki	2021/9/29	Ikarashi	OK
	fnc[14-8-1]	Buzzer basic settings	○	2021/9/29	Taki	2021/9/30	Ikarashi	OK
	fnc[14-8-2]	Buzzer frequency adjustment	○	2021/9/29	Taki	2021/9/30	Ikarashi	OK
	fnc[14-8-3]	Buzzer sound output adjustment	○	2021/9/29	Taki	2021/9/30	Ikarashi	OK
	fnc[14-8-4]	Buzzer duty adjustment	○	2021/9/29	Taki	2021/9/30	Ikarashi	OK
	fnc[14-8-5]	Special state buzzer operation	○	2021/9/29	Taki	2021/9/30	Ikarashi	OK
	fnc[14-9-1]	Vibration motor operation control	×	2021/9/29	Taki	2021/9/30	Ikarashi	OK
	fnc[14-10-1]	Key monitoring	×	2021/9/29	Taki	2021/9/30	Ikarashi	OK
	fnc[14-10-2]	Key event	×	2021/9/29	Taki	2021/9/30	Ikarashi	OK
	fnc[14-11-1]	Thermistor temperature acquisition	×	2021/9/29	Taki	2021/9/30	Ikarashi	OK
	fnc[14-12-1]	Pump control	×	2021/9/29	Taki	2021/9/30	Ikarashi	OK
	fnc[14-13-1]	Pressure acquisition	×	2021/9/29	Taki	2021/9/30	Ikarashi	OK
	fnc[14-14-1]	Hall IC power supply ON	×	2021/9/29	Taki	2021/9/30	Ikarashi	OK
	fnc[14-15-1]	Combustible gas sensor output acquisition	○	2021/9/29	Taki	2021/9/30	Ikarashi	OK
	fnc[14-16-1]	Obtain oxygen/toxic gas sensor output	○	2021/9/29	Taki	2021/9/30	Ikarashi	OK
	fnc[14-17-1]	Lithium rechargeable battery voltage acquisition	○	2021/9/29	Taki	2021/9/30	Ikarashi	OK

Request number	Function number	Check Item	Judgment
req[1]	fnc[1-1-1]	**NC sensor concentration acquisition**	OK
		･Use the current sensor output to calculate the concentration.	OK
		･When detecting hydrogen, perform concentration calculation only with B element.	OK
		･In the judgment of the differential mode operation, when the current is energized the previous time and the change of the current sensor output is less than the prescribed value (0.02 mV), the difference mode operation is performed and the tracking is performed for each density calculation.	OK
		･Differential mode shall transition only during measurement mode and display mode.	OK
		･If tracking is regulated to the lower limit value, tracking is not performed any more, and the numerical value of the lower limit is stipulated on the prescribed condition. Specified value： Upper limit: sensor output at AIR + 0.50 mV ± 0.005 mV / difference temperature Lower limit: sensor output at AIR + 0.16 mV ± 0.005 mV / difference temperature	OK
		･Transition to the over mode when the previous energization and the current sensor output are over the specified output (5 mV).	OK
		･For over mode, set the concentration value to full scale+1 digits.	OK
		･For sensor output values that are neither differential nor over mode, perform output mode operation.	OK
		･If the span output is less than the specified value (0.05 mV) for 4 consecutive conductions, make a judgment on differential mode operation.	OK
		･Conduct concentration calculation using ppm value for concentration calculation.	OK
		･Calculate the ppm concentration and convert it to %LEL using the appropriate 100% LEL ppm value.	OK
		･Concentration value calculated shall be rounded off.	OK
	fnc[1-1-2]	**NC sensor temperature correction**	OK
		･Zero temperature compensation at the specified value. Specified value: 0.000113x^2+0.021x[mV]	OK
		･Temperature correction of span output at specified value. Specified value: 0.00005x^2-0.001x+1.000[mV]	OK
	fnc[1-1-3]	**NC sensor humidity correction**	OK
		･Zero humidity compensation at the specified value. Specified value: -0.00537x[mV]	OK
		･Humidity correction of span output at specified value. Specified value: 0.003x[mV]	OK
	fnc[1-1-4]	**NC sensor full scale**	OK
		･For Initial/Measurement/Display mode, concentrations above full scale are set to full scale+1 digit.	OK
		･In cases other than Initial/Measurement/Display mode, calculate concentrations up to 120% of full scale.	OK
	fnc[1-1-5]	**NC sensor negative**	OK
		･In the Initial/Measurement/Display mode, "0" indicates from 0 to -5% of UpperLimit.	OK
		･In Initial/Measurement/Display mode, a negative true value is displayed from -5% to -10% of UpperLimit.	OK
		･In the Initial/Measurement/Display mode, if it exceeds −10% of the UpperLimit, it is displayed as negative over, and an alarm is issued.	OK
		･In cases other than the initial/measurement/display mode, the positive value calculated by the concentration calculation is displayed.	OK
	fnc[1-1-6]	**NC sensor Intermittent operation**	OK
		･Element energization cycle repetition timing is A element ON for 1sec, B element ON for 1sec, OFF for 3sec.	OK
		･When long life mode is ON, element energization cycle repetition timing is A element ON for 1sec, B element ON for 1sec, OFF for 13sec.	OK
		･After sensor protection is restored, energization resumes from A element.	OK
	fnc[1-1-7]	**NC sensor sensor protection**	OK
		･When the concentration value exceeds the full scale in the measurement/display mode, the device is not energized.	OK
		･When oxygen is 20.0% or more, do not stop energization.	OK
		･When oxygen reaches 20.0% or more after energization is stopped, terminate protection and resume energization.	OK
		･When restarting energization, do not start protection againg but allot 30 sec for warm up.	OK
		･When the oxygen sensor is OFF, press the key to end sensor protection and resume energization.	OK
	fnc[1-2-1]	**EC sensor concentration acquisition**	OK
		･Use the current sensor output to calculate the concentration.	OK
		･Concentration value calculated shall be rounded off.	OK

fnc[1-2-2]	**EC sensor temperature correction**	OK
	･Perform zero temperature compensation with the temperature compensation coefficient specified for each gas type. O2：0mV H2S(ESR-A1DP)：0mV H2S(ESR-A13i)：0mV CO(ESR-A1DP/A13P)：0mV CO(ESR-A1CP)：0mV	OK
	･Zero temperature compensation adds a coefficient to the sensor output and corrects the sensor output from the current temperature of zero to the sensor output from zero of the reference temperature.	OK
	･Perform span temperature compensation with temperature compensation coefficient specified for each gas type. O2：-0.000021x^2+0.0023x+0.9642mV H2S(ESR-A1DP)：0.0000000586x^4-0.0000065237x^3+0.0004313478x^2-0.0245006527x+1.4298030768[mV] H2S(ESR-A13i)：0.0000000414x^4-0.0000065892x^3+0.0005294489x^2-0.0286198167x+1.4728501861[mV] CO(ESR-A1DP/A13P)：0.0000001875x^4-0.0000275873x^3+0.0016012091x^2-0.0555594753x+1.7382327621[mV] CO(ESR-A1CP)：-0.000000002x^4+0.000001161x^3-0.000044877x^2+0.011618243x+0.720980128[mV] 0.000000085x^4+0.000004281x^3+0.000307873x^2+0.015912975x+0.300492533[mV] -0.000000001x^4+0.000000381x^3+0.000015735x^2+0.014800958x+0.615787290[mV] 0.000000146x^4+0.000004250x^3+0.000280741x^2+0.015805903x+0.295647657[mV]	OK
	･Span temperature compensation achieved by correcting the current temperature span output to that of the reference temperature bymultiplying the sensor span output with a coefficent.	OK
fnc[1-2-3]	**EC sensor full scale**	OK
	･For Initial/Measurement/Display mode, concentrations above full scale are set to full scale+1 digit.	OK
	･In cases other than Initial/Measurement/Display mode, calculate concentrations up to 120% of full scale.	OK
fnc[1-2-4]	**EC sensor negative**	OK
	･In the Initial/Measurement/Display mode, "0" indicates from 0 to -5% of UpperLimit.	OK
	･In Initial/Measurement/Display mode, a negative true value is displayed from -5% to -10% of UpperLimit.	OK
	･In the Initial/Measurement/Display mode, if it exceeds −10% of the UpperLimit, it is displayed as negative over, and an alarm is issued.	OK
	･In cases other than the initial/measurement/display mode, the positive value calculated by the concentration calculation is displayed.	OK
fnc[1-2-5]	**Correction for sudden O2 sensor pressure change**	OK
	･The reading should not fluctuate even when pressure is applied with a rubber bulb with the calibration cap attached.	OK
	･The reading should not fluctuate even when pressure is applied with a pump with the calibration cap attached.	OK
	･Should be able to satisfy the JIS standard requirement (for an alarm in 5 sec or less at 18.0% on delivery of 10.0 to 11.0% gas)when a gas such as N2 with a an O2 concentration dropping from 20.9% down to 0%.	OK
	･Only measurement and display mode shuold operate; no other modes should run.	OK

fnc[1-3-1]	**Calibration curve processing**	OK
	・Apply an appropriate calibration curve for each gas.	OK
	・Calculating the corrected 0-FS ratio from the pre-corrrected 0-FS ratio.	OK
	・Apply linear correction when outside the 0-FS range.	OK
fnc[1-3-2]	**Reverse calibration curve processing**	OK
	・Apply an appropriate calibration curve for each gas.	OK
	・Calculating the pre-corrected 0-FS ratio from the corrected 0-FS ratio.	OK
	・Apply linear correction when outside the 0-FS range.	OK
fnc[1-4-1]	**Zero tracking processing**	OK
	・Perform zero tracking every 30 seconds.	OK
	・Flammable or oxygen sensor should not carry out this zero tracking.	OK
	・Take 4 average values for 30 seconds and track only when the instruction fluctuates at regular intervals in a fixed direction.	OK
	・Do not track if average value is less than 4.	OK
	・Do not follow up for 2 minutes after AIR calibration.	OK
	・If the newest average value is outside the range of the 1st alarm point to the -1 × 1st alarm point, do not follow.	OK
	・ If the fluctuation of the instruction is out of the specified range, do not track.	OK
	・Perform only during measurement and display mode.	OK
	・In the mode other than during measurement and display mode, zero tracking is automatically turned off.	OK
	・When zero tracking ON / OFF setting is OFF, zero tracking is not performed.	OK
fnc[1-5-1]	**Smoothing process**	OK
	・After calculating the concentration, if the concentration is other than oxygen, the concentration is changed from 0 to the prescribed value MAX with the specified value MIN to the specified value MAX. NCR：2%LEL〜5%LEL H2S(ESR-A1DP)：0.3ppm〜0.3ppm H2S(ESR-A13i)：0.3ppm〜0.3ppm CO(ESR-A1DP/A13P)：2ppm〜2ppm CO(ESR-A1CP)：2ppm〜2ppm	OK
	・After calculating the concentration, in the case of oxygen, set the concentration to 20.9 to ± the specified value MAX with the specified value MIN of ~ 20.9% ~ the specified value MAX. O2：19.5%〜20.4%/21.4%〜22.3%	OK
	・Perform only during measurement and display mode.	OK
	・Automatically turn off the smoothing process in modes other than measurement mode and display mode.	OK
	・When the ON/OFF setting of the suppress is OFF, the smoothing process is not performed.	OK
fnc[1-5-2]	**Cutoff processing**	OK
	・After concentration calculation, set the density to 0 by the specified value MAX with the specified value MIN = the specified value MAX. NCR：2%LEL〜5%LEL O2：19.5%〜20.4%/21.4%〜22.3% H2S(ESR-A1DP)：0.3ppm〜0.3ppm H2S(ESR-A13i)：0.3ppm〜0.3ppm CO(ESR-A1DP/A13P)：2ppm〜2ppm CO(ESR-A1CP)：2ppm〜	OK
	・Perform only during measurement and display mode.	OK
	・Automatically turn off the cut-off process for modes other than the measurement mode and the display mode.	OK
	・When the ON/OFF setting of the suppressor is OFF, cut-off processing is not performed.	OK
fnc[1-6-1]	**Peak value acquisition**	OK
	・Confirm whether the peak value has been updated after the concentration calculation.	OK
	・When the peak value is updated, the updated time is also recorded.	OK
fnc[1-7-1]	**Peak value display**	OK
	・Failed sensor is indicated by “---”.	OK
	・Unused gas is blank.	OK
	・Oxygen gas indicates the peak value in the zero concentration direction.	OK
	・Gases other than oxygen display peak values in the full-scale direction.	OK
	・If there is a change in the peak value, the display is updated.	OK

	fnc[1-8-1]	**Peak value reset**	OK
		・Enabled in peak value display in display mode.	OK
		・The peak value can be cleared by pressing the AIR key for three seconds within the peak value display.	OK
		・The AIR key press HOLD > RELEASE appears in the comment field during peak clearing.	OK
		・If password protection is ON, the peak value cannot be cleared.	OK
	fnc[1-9-1]	**Average value acquisition**	OK
		・Integrate the concentrations calculated by the concentration calculation every second to create an average concentration of 60 seconds.	OK
	fnc[1-10-1]	**STEL value acquisition**	OK
		・STEL=(15 minutes integrated value by 1 minute average value) / 15.	OK
		・Updating the value every 60 seconds.	OK
	fnc[1-11-1]	**STEL value display**	OK
		・Failed sensor is indicated by “---”.	OK
		・Unused gas is blank.	OK
		・If all but HC and OX are unused, the display is skipped.	OK
		・Update the display every 60 seconds.	OK
	fnc[1-12-1]	**TWA value acquisition**	OK
		・TWA=(8 hours integrated value by 1 minute average) / 480.	OK
		・Updating the value every 60 seconds.	OK
	fnc[1-13-1]	**TWA value display**	OK
		・Failed sensor is indicated by “---”.	OK
		・Unused gas is blank	OK
		・If all but HC and OX are unused, the display is skipped.	OK
		・Update the display every 60 seconds.	OK
	fnc[1-14-1]	**Cumulative value acquisition**	OK
		・Calculation of cumulative = (1 hour integrated value by 1 minute average) / 60.	OK
		・Updating the value every 60 seconds.	OK
	fnc[1-15-1]	**Cumulative value display**	OK
		・Failed sensor is indicated by “---”.	OK
		・Unused gas is blank.	OK
		・Be displayed when CO is valid and cumulative display is ON.	OK
		・Otherwise not displayed.	OK
		・Update the display every 60 seconds.	OK

Request number	Function number	Check Item	Judgment
req[2]	fnc[2-1-1]	**Gas alarm latching operation**	OK
		・Proper latching operation.	OK
		・When an alarm is issued, the alarm is not cancelled even if the AIR or MODE key is pressed when the concentration is higher than the alarm point.	OK
		・When an alarm is issued, the alarm process does not end unless the AIR or MODE key is pressed even if the concentration falls below the alarm point.	OK
		・If password protection is ON, press AIR+MODE to transition to the password screen.	OK
		・When the concentration value is below the alarm point, the alarm is canceled with the AIR or MODE key.	OK
	fnc[2-1-2]	**Gas alarm auto reset operation**	OK
		・Correct auto reset.	OK
		・When an alarm is issued, the alarm is not cancelled even if the AIR or MODE key is pressed when the concentration is higher than the alarm point.	OK
		・Automatically cancel the alarm when the concentration value is below the alarm point.	OK
	fnc[2-1-3]	**Gas alarm display**	OK
		・Flash only the gas type for which gas alarm is being issued on the measurement screen.	OK
		・When various types of gas alarms are being issued on the measurement screen, the alarm level should be displayed for each gas type. If the alarm cannot be displayed for each gas alarm, display the alarm with the highest priority.	OK
		・The priority of gas alarm display is 1st<2nd<3rd<negative F.S.<F.S.<1H<TWA<STEL.	OK
		・When gas alarm is displayed, turn on the backlight all the time.	OK
		・For all alarm OFF settings, display the icon "NO ALARM" on the measurement screen.	OK
	fnc[2-1-4]	**Gas alarm reset**	OK
		・The alarm can be cancelled by pressing the AIR or MODE key in accordance with the latch/auto reset operation when gas alarm is issued.	OK
		・When password protection is set to ON, pressing AIR or MODE shall not cancel the alarm.	OK
		・If password protection is ON, press AIR+MODE to transition to the password screen.	OK
		・Enter the correct password on the password screen to clear the alarm.	OK
		・If an incorrect password is entered on the password screen, an error message appears and the alarm should not be cancelled.	OK
		・Press the MODE key during error display to return to measurement mode.	OK
		・If no operation is performed for 40 seconds on the password screen or error display screen, the alarm is not cancelled and the measurement mode is automatically restored.	OK
	fnc[2-1-5]	**Gas warning notification processing**	OK
		・If the concentration is above the alarm point, issue an alarm.	OK
		・Alarm priority is 1st<2nd<3rd<negative F.S.<F.S.<1H<TWA<STEL.	OK
		・Alarm only during measurement mode and display mode.	OK
		・In the case of all alarm OFF setting, the alarm shall not be issued regardless of the alarm point setting.	OK
		・Operate the buzzer/vibration motor/LED with the tone for 1st alarm when 1st alarm is issued.	OK
		・Operate buzzer/vibration motor/LED with F.S.OVER alarm tone when 2nd alarm is issued.	OK
		・Operate buzzer/vibration motor/LED with F.S.OVER alarm tone when 3rd alarm is issued.	OK
		・Operate the buzzer/vibration motor/LED with the tone color of the failure alarm when issuing a negative OVER alarm.	OK
		・Operate the buzzer/vibration motor/LED with the tone for the F.S.OVER alarm when the F.S.OVER alarm is issued.	OK
		・Operate buzzer/vibration motor/LED with the tone for 1st alarm when STEL alarm is issued.	OK
		・Operate buzzer/vibration motor/LED with tone for 1st alarm when TWA alarm is issued.	OK
		・Operate buzzer/vibration motor/LED alternately for 1st and F.S.OVER alarms when cumulative alarm is issued.	OK
		When alarm silence is set to ON	OK
		・When the 1st alarm is issued and the MODE key is pressed, the buzzer stops and only the LED and vibration operate as the 1st alarm.	OK
		・When the 1st alarm is issued and the indicated value reaches the 2nd alarm during silent operation, the buzzer, LED, and vibration will operate as the 2nd alarm.	OK
		・When the 2nd alarm is issued and the MODE key is pressed, the buzzer stops and only the LED and vibration act as the 2nd alarm.	OK
		・When the 2nd alarm is issued and the indicated value reaches the 3rd alarm during silent operation, the buzzer, LED, and vibration will operate as the 3rd alarm.	OK
		・When the 3rd alarm is issued and the MODE key is pressed, the buzzer stops and only the LED and vibration operate as the 3rd alarm.	OK
		・When the 3rd alarm is issued and the indicated value reaches the OVER alarm during silent operation, the buzzer, LED, and vibration will operate as an OVER alarm.	OK

	・When the MOVER alarm is issued and the MODE key is pressed, the buzzer stops and only the LED and vibration operate as the MOVER alarm.	OK
	・When the MOVER alarm is issued and the indicated value reaches the 1st alarm during silent operation, the buzzer, LED, and vibration will activate the MOVER alarm.	OK
	・If the 2nd alarm is issued and the indicated value falls below the 2nd alarm during silent operation, the buzzer will remain stopped and only the LED and vibration will act as the 2nd alarm.	OK
fnc[2-2-1]	**Alarm point setting**	OK
	・1st→2nd→3rd can be set for 1ch (combustible sensor).	OK
	・In the case of 2ch (oxygen sensor), 1st→2nd→3rd can be set in this order.	OK
	・For 3ch (H2S sensor), set 1st→2nd→3rd→STEL→TWA.	OK
	・For 4ch (CO sensor), set 1st→2nd→3rd→STEL→TWA or integration.	OK
	・When the alarm point setting range is OFF, the alarm point cannot be set.	OK
	・TWA or integration of CO sensor depends on ON/OFF of integration setting and is automatically switched.	OK
	・Do not record settings until all alarm points have been set for each gas type.	OK
	・When setting the gas alarm point, press AIR+MODE for 1 second to return to the previous alarm point.	OK
	・Oxygen cannot be set otherwise because of the order 1st>2nd.	OK
	・Since there is a rank of 1st<2nd<3rd other than oxygen, it cannot be set otherwise.	OK
	・The alarm point cannot be set outside the alarm point setting range for each sensor.	OK
	NCR: 1% LEL ≦ 1st ≦ 2nd ≦ 3rd ≦ 60% LEL, OFF ≦ STEL ≦ OFF, OFF ≦ TWA ≦ OFF	OK
	O2: 0.0% ≦ 2nd ≦ 1st ≦ 20.0%, 21.8% ≦ 3rd ≦ 25.0%, OFF ≦ STEL ≦ OFF, OFF ≦ TWA ≦ OFF	OK
	CO:12ppm≦1st≦2nd≦3rd≦2000ppm, 12ppm≦STEL≦2000ppm, 12ppm≦TWA≦2000ppm	OK
	H2S:0.5ppm≦1st≦2nd≦3rd≦200.0ppm, 0.5ppm≦STEL≦200.0ppm, 0.5ppm≦TWA≦200.0ppm	OK

	fnc[2-3-1]	**Gas alarm latching/automatic reset setting**	OK
		・Setting of latching/auto reset by operation of the main unit.	OK
		・Alarm operation shall be latching when gas alarm latching auto reset setting is ON.	OK
		・When the gas alarm latching auto reset setting is OFF, the alarm action shall be auto reset.	OK
		・Switching ON/OFF with AIR key during setting.	OK
		・MODE key can be used during configuration.	OK
		・Cancel by pressing and holding the AIR+MODE key and exit the setting items.	OK
	fnc[2-4-1]	**TWA alarm/Cumulative alarm setting**	OK
		・TWA/Accumulation cannot be set by the main unit operation.	OK
		・Setting TWA/Accumulation with Communication Commands.	OK
	fnc[2-5-1]	**All gas alarm OFF setting**	OK
		・ All gas alarm OFF cannot be set by operation of the main unit.	OK
		・Setting all gas alarm OFF by communication command.	OK
	fnc[2-6-1]	**Alarm silence setting**	OK
		・Setting alarm silence by operation of the main unit.	OK
		・Setting alarm silence by communication command.	OK
		・When the alarm silence setting is ON, the alarm silence processing should function.	OK
		・When the alarm silence setting is OFF, the alarm silence processing does not work.	OK
		・Switching ON/OFF with AIR key during setting.	OK
		・MODE key can be used during configuration.	OK
		・Cancel by pressing and holding the AIR+MODE key and exit the setting items.	OK

Request number	Function number	Check Item	Judgment
req[3]	fnc[3-1-1]	**Fault alarm latching operation**	OK
		･Do not cancel the alarm unless the AIR or MODE key is pressed when issuing a fault alarm.	OK
	fnc[3-1-2]	**Fault alarm display**	OK
		･Messages on fault classification when displaying fault alarms.	OK
		･Operate the buzzer/vibration motor/LED with the tone for fault alarm when fault alarm is displayed.	OK
		･Always turn on the backlight when a failure alarm is issued.	OK
	fnc[3-1-3]	**Fault USB communication**	OK
		･If a communicable USB device is connected when a failure alarm is issued, stop the failure alarm and transition to communication mode.	OK
	fnc[3-1-4]	**Fault detail display**	OK
		･When a fault alarm is displayed, the detailed fault number shall be displayed in three digits in the case of a fault that can be displayed.	OK
		･Error display only in Initial/Measurement/Display mode.	OK
		･Display abnormal fault in all modes only for a low battery voltage fault.	OK
	fnc[3-1-5]	**Fault alarm reset**	OK
		･The resettable alarm can be cleared by pressing the AIR or MODE key when a failure alarm is issued.	OK
		･A non-resettable alarm cannot be cleared by pressing the AIR or MODE key when a failure alarm is issued.	OK
		･When a failure alarm is issued, the non-resettable alarm shall be reset only by turning off the power supply to the main body of the equipment.	OK
	fnc[3-2-1]	**System check**	OK
		･It is possible to normally detect a ROM failure (can not be reset) (000).	OK
		･It is possible to normally detect a RAM fault (reset impossible) (010).	OK
		･It is possible to normally detect a FRAM failure (reset not possible) (021).	OK
		･It is possible to normally detect FLASH abnormality (reset possible) (031).	OK
	fnc[3-2-2]	**Internal clock check**	OK
		･It is possible to detect clock errors normally (resettable) (050).	OK
		･Ability to detect abnormal backup battery stop abnormality (reset possible) (051).	OK
	fnc[3-2-3]	**Circuit voltage check**	OK
		･Able to detect abnormal circuit voltage normally (cannot be reset) (080). SV(AN004), MV(AN005) : Outside the range of 1320 to 1480mV ECV1(AN006) : Outside the range of 540 to 660mV ECV2(AN007) : Outside the range of 1120 to 1280mV ECV3(AN024) : Outside the range of 2100 to 2300mV HCV(AN025) : Outside the range of 930 to 1100mV PZF(AN026) : Outside the range of 1900 to 2100mV When 2.8V becomes 2.48V or less for 5 seconds or more with the LVD function	OK
	fnc[3-2-4]	**Thermistor error check**	OK
		･It is possible to detect a thermistor abnormality normally (reset impossible) (082). When the thermistor A / D value is outside the threshold of mV equivalent to -55 ° C to mV equivalent to	OK
	fnc[3-2-5]	**Sensor error check**	OK
		･Ability to check sensor abnormality of 1 ch (combustible sensor) (less than 15 mV).	OK
		･Ability to check sensor abnormality of 2 ch (oxygen sensor) (less than 5 mV).	OK
		･Ability to check sensor abnormality of 3 ch (H2S sensor) (less than 5 mV).	OK
		･Ability to check sensor abnormality of 4 ch (CO sensor) (less than 5 mV).	OK
		･If sensor error occurs in the initial mode, the user should verify the error, turn off the abnormal sensor, then perform measurement.	OK
		･Reset prohibited if all sensors have failed in the initial mode.	OK
		･Reset prohibited if sensor abnormality occurs in measurement/display mode.	OK
		･Sensors with the setting OFF shall not check for sensor abnormality.	OK
	fnc[3-2-6]	**EC connection check**	OK
		･EC check of 2 ch (oxygen sensor) can be checked (less than 5 mV).	OK
		･EC connection check of 3 ch (H2S sensor) can be performed (less than 5 mV).	OK
		･EC check of 4 ch (CO sensor) can be checked (less than 5 mV).	OK
	fnc[3-2-7]	**Battery voltage drop check**	OK
		･In the case of lithium-ion batteries, display a battery voltage error when the battery voltage falls below 3.4V.	OK
		･In the case of lithium-ion batteries, when the battery voltage falls below 3.1V, forcibly shut down the main power supply.	OK
	fnc[3-2-8]	**Sensor circuit error check**	OK

		・It is possible to normally detect a sensor circuit fault (reset impossible) (081). When communication fails more than 3 times. Sensor MCU error.	OK
	fnc[3-2-9]	**Flow error check**	OK
		・When the output difference between the pressure sensor when the pump is OFF and when it is ON is 400mV or more, the flow rate drop error is displayed (resettable) (500)	OK
		・If the measured gas is H2, no failure judgment is made.	OK
		・During purge processing, failure detection is not performed.	OK
		・Error display only in initial/measurement/display mode	OK
	fnc[3-2-10]	**Pump error check**	OK
		・When the output difference of the pressure sensor when the pump is OFF and when it is ON is less than 5mV, the pump disconnection error is displayed (reset possible) (503)	OK

Request number	Function number	Check Item	Judgment
req[4]	fnc[4-1-1]	**BUMP test**	OK
		･Press the MODE key to display the cylinder select screens A to E.	OK
		･The BUMP adjustment value for each gas is displayed on the cylinder select screens A to E.	OK
		･Cylinders with no gas distribution in the cylinder setting shall not be displayed.	OK
		･Press the AIR key to switch [Cylinder Select Screen A to E/ESCAPE].	OK
		BUMP test execution	OK
		･Press the MODE key to start the BUMP test.	OK
		･During the BUMP test, the current reading shall be displayed in real time.	OK
		･To prompt the introduction of gas, flash the concentration value portion and display "APPLY".	OK
		･When the BUMP test is started, the timer at the top of the screen shall be counted down.	OK
		･Timer time shall be the same as GAS TIME setting time.	OK
		･When the BUMP test is PASS, display the BUMP result when the timer becomes 0.	OK
		･When BUMP test is FAIL and calibration after failure is ON, transition to BUMP calibration shall be made when timer becomes 0	OK
		･When the BUMP test is FAIL and the calibration after failure is OFF, the BUMP result is displayed when the timer becomes 0.	OK
		BUMP results display	OK
		･The result of the BUMP test shall be indicated by "P" or "F" for each gas.	OK
		･If the result is FAIL, an alarm tone sounds.	OK
		･On the Results display screen, the AIR key should be able to switch between the BUMP/BUMP calibration and both results.	OK
		･Displaying the BUMP/BUMP calibration results on the results display screen, display the concentration of the results.	OK
		･When BUMP calibration is OFF, BUMP calibration result shall not be displayed.	OK
		･Press the MODE key to switch to user mode.	OK
	fnc[4-1-2]	**BUMP calibration**	OK
		･Bump calibration shall be executed only when bump calibration setting is ON after BUMP test FAIL.	OK
		･When BUMP calibration setting is OFF, BUMP calibration shall not be performed even if BUMP test is FAIL.	OK
		･During BUMP calibration, the current reading shall be displayed in real time.	OK
		･To prompt the introduction of gas, flash the concentration value portion and display "APPLY".	OK
		･When BUMP calibration is started, the timer at the top of the screen shall be counted down.	OK
		･Timer time shall be the same as CAL TIME set time minus GAS TIME set time.	OK
		･Execute the calibration process when the timer reaches 0 and end the BUMP calibration.	OK
		･When the flammable sensor is at the limit operation at the end of calibration, a limit warning should be displayed before the BUMP result is displayed.	OK
		･At the end of calibration, if the flammable sensor is not at limit operation, display the BUMP result.	OK
		･The limit indication of the flammable sensor shall sound an alarm and wait until the MODE key is	OK
	fnc[4-1-3]	**BUMP calibration ON/OFF setting**	OK
		･Press the MODE key in the "AUTO CAL" item of the BUMP condition setting to enter the BUMP failure calibration setting.	OK
		･Press AIR to switch ON/OFF.	OK
		･Press the MODE key to record the selected contents and exit the calibration setting after BUMP failure.	OK
		･Press and hold the AIR+MODE key to change to BUMP condition setting without recording the selected contents.	OK
	fnc[4-1-4]	**BUMP condition setting**	OK
		･Select the BUMP condition setting and press the MODE key to enter the BUMP condition setting.	OK
		･Press the AIR key to switch items.	OK
		･Press AIR+MODE key briefly to change the display order of AIR keys.	OK
		･Press and hold AIR+MODE key to transition to the item before transition to BUMP condition setting.	OK
		Gas suction time setting	OK
		･Select the gas suction time setting and press the MODE key to enter the gas suction time setting.	OK
		･Press AIR to switch [30/45/60/90].	OK
		･Press the MODE key to determine the number.	OK
		･If you press the AIR+MODE key for a short time, you can switch the ascending or descending order of numeric values.	OK
		･When AIR+MODE key is pressed and held, the selected contents are not recorded, and transition is made to bump condition setting.	OK
		･The gas suction time of the bump test should match the set time.	OK
		Bump threshold setting	OK

・Select the bump threshold setting and press the MODE key to enter the bump threshold setting.	OK
・Press AIR to switch [10/20/30/40/50].	OK
・Press the MODE key to determine the number.	OK
・If you press the AIR+MODE key for a short time, you can switch the direction of increase or decrease of the numerical value.	OK
・When AIR+MODE key is pressed and held, the selected contents are not recorded, and transition is made to bump condition setting.	OK
・The set value is reflected as the bump threshold value.	OK
Setting of calibration time after bump failure	OK
・Select the calibration time after bump failure setting and press the MODE key to enter the calibration time after bump failure setting.	OK
・Press AIR to switch [90/120].	OK
・Press the MODE key to determine the number.	OK

		・When AIR+MODE key is pressed and held, the selected contents are not recorded, and transition is made to bump condition setting.	OK
		・The calibration time of the bump test is set to (CAL TIME-GAS TIME) for the same time.	OK
	fnc[4-1-5]	**BUMP failure alarm reset**	OK
		・If the BUMP result display indicates a failure alarm, reset the alarm when the BUMP result display exits.	OK
	fnc[4-2-1]	**Gas alarm test**	OK
		・Alarm point display can be switched with AIR key.	OK
		Full scale	OK
		・The full-scale value and the set value displayed are correct.	OK
		・Over alarm operation with AIR+MODE key.	OK
		・Correct operation of buzzer, LED and vibration motor.	OK
		・When a test alarm is issued, press the key to turn off the test alarm.	OK
		1st alarm point	OK
		・Correct alarm points and settings.	OK
		・To perform 1st alarm operation with AIR+MODE key.	OK
		・Correct operation of buzzer, LED and vibration motor.	OK
		・When a test alarm is issued, press the key to turn off the test alarm.	OK
		2nd alarm point	OK
		・Correct alarm points and settings.	OK
		・2nd alarm operation with AIR+MODE key.	OK
		・Correct operation of buzzer, LED and vibration motor.	OK
		・When a test alarm is issued, press the key to turn off the test alarm.	OK
		3rd alarm point	OK
		・Correct alarm points and settings.	OK
		・Using the AIR+MODE key to perform 3rd alarm operation.	OK
		・Correct operation of buzzer, LED and vibration motor.	OK
		・When a test alarm is issued, press the key to turn off the test alarm.	OK
		STEL alarm point	OK
		・Correct alarm points and settings.	OK
		・If all but the combustible/oxygen sensors are not used, the display shall be skipped.	OK
		・STEL alarm operation with AIR+MODE key.	OK
		・Correct operation of buzzer, LED and vibration motor.	OK
		・When a test alarm is issued, press the key to turn off the test alarm.	OK
		TWA alarm point	OK
		・Correct alarm points and settings	OK
		・If all but the combustible/oxygen sensors are not used, the display shall be skipped.	OK
		・TWA alarm operation with AIR+MODE key.	OK
		・Correct operation of buzzer, LED and vibration motor.	OK
		・When a test alarm is issued, press the key to turn off the test alarm.	OK
		Cumulative alarm point	OK
		・Correct alarm points and settings.	OK
		・Display shall be passed except when the CO sensor is enabled/integrated alarm is ON.	OK
		・Integrated alarm operation with AIR+MODE key.	OK
		・Correct operation of buzzer, LED and vibration motor.	OK
		・When a test alarm is issued, press the key to turn off the test alarm.	OK

Request number	Function number	Check Item	Judgment
req[5]	fnc[5-1-1]	**Air calibration**	OK
		･It is possible to record the current sensor output as an air output with 1 ch (burnable sensor) (65 mV to 85 mV).	OK
		･It is possible to record the current sensor output as air output with 2 ch (oxygen sensor) (1230mV to 2050mV).	OK
		･It is possible to record the current sensor output as air output with 3 ch (H2S sensor) (-8.6 mV to 8.6 mV).	OK
		･It is possible to record the current sensor output as air output with 4 ch (CO sensor) (-8.6 mV to 8.6 mV).	OK
		･The reading is 0% LEL after AIR calibration with 1ch (combustible sensor).	OK
		･The reading is 20.9% after AIR calibration with 2ch (oxygen sensor).	OK
		･The reading is 0ppm after AIR calibration with 3ch (H2S sensor).	OK
		･The reading is 0ppm after AIR calibration with 4ch (CO sensor).	OK
		･If the air calibration process fails, retain the previous air calibration value.	OK
		･If the air calibration process fails, perform up to three retries.	OK
		･For air calibration that is not demand zero/auto zero calibration, display the current concentration after successful calibration.	OK
	fnc[5-1-2]	**Air calibration error display**	OK
		･Display air calibration error when AIR calibration fails.	OK
		･When AIR Calibration Abnormality is displayed, the "FAIL" should flash for the failed gas.	OK
		･When AIR calibration error is displayed, the gas name/unit of the failed gas shall flash.	OK
	fnc[5-2-1]	**Demand zero calibration**	OK
		･If the AIR key is pressed and held during measurement mode, air calibration shall be possible.	OK
		･Display "HOLD" after AIR is pressed for 1 second to prompt long press of AIR key.	OK
		･Display "RELEASE" after AIR is pressed for 3 seconds to prompt release of AIR key.	OK
		･If the AIR key is released while "HOLD" is displayed, do not perform air calibration.	OK
		･If air calibration is successful, return to measurement mode.	OK
		･If a gas alarm is issued during air calibration, the gas alarm is not reset.	OK
		･If a gas alarm is issued during air calibration, the alarm is not sounded during air calibration.	OK
	fnc[5-2-2]	**Demand zero calibration ON/OFF setting**	OK
		･Allow the AIR key to switch ON/OFF.	OK
		･MODE key can be used to decide.	OK
		･Cancel by pressing and holding AIR+MODE key and exit the item.	OK
		･When demand zero is ON, demand zero is valid.	OK
		･When demand zero is OFF, demand zero is disabled.	OK
	fnc[5-2-3]	**Demand zero calibration error display**	OK
		･Displays air calibration error when zero demand calibration fails.	OK
		･Flashes "FAIL" for the failed gas when the demand zero calibration fails.	OK
		･The gas name/unit of the failed gas flashes when the zero calibration fails.	OK
		･Reset the error indication with the MODE key and transition to measurement mode.	OK
	fnc[5-3-1]	**Auto zero calibration**	OK
		･Prompt whether to perform auto-zero calibration at the end of the initial mode.	OK
		･Execute auto-zero calibration when MODE key is pressed on auto-zero calibration prompt.	OK
		･Press the AIR key at the auto-zero calibration prompt to switch to the measurement mode.	OK
		･If there is no input for 15 seconds auto-zero calibration prompt, automatically transitions to measurement mode.	OK
		･Transition to measurement mode when air calibration is successful.	OK
		･If the air calibration fails, an auto zero calibration error is displayed.	OK
	fnc[5-3-2]	**Auto zero calibration ON/OFF setting**	OK
		･Allow the AIR key to switch ON/OFF.	OK
		･MODE key can be used to decide.	OK
		･Cancel by pressing and holding AIR+MODE key and exit the item.	OK
		･When Auto Zero is ON, Auto Zero is enabled.	OK
		･When Auto Zero is OFF, Auto Zero is disabled.	OK
	fnc[5-3-3]	**Auto zero calibration error display**	OK
		･Display air calibration error when auto zero calibration fails.	OK
		･Flash "FAIL" for failed gas when auto zero calibration error fails.	OK
		･Flash the gas name/unit of the failed gas when the auto zero calibration fails.	OK
		･Reset the error indication with the MODE key and transition to measurement mode.	OK

fnc[5-4-1]	**Auto calibration**	OK
	・Press the MODE key when selecting Auto Calibration to change to Auto Calibration.	OK
	・Auto calibration items shall be in the order of calibration cylinders A to E/start measurement/calibration concentration setting/cylinder setting/escape.	OK
	・Allow the AIR key to switch the auto calibration items.	OK
	・Short press of AIR+MODE key to reverse the display order of AIR key.	OK
	・The auto calibration item can be exited by pressing and holding the AIR+MODE key.	OK
	・Calibration Cylinders A-E shall be displayed only if there are unused gas species.	OK
	・Display calibration cylinders A to E only the gas types set for each cylinder.	OK
	・Display the calibration concentration set for each gas type displayed.	OK
	Auto calibration	OK
	・Select calibration cylinders A-E and press the MODE key to enter the auto calibration standby state.	OK
	・In the standby state, the reading is updated in real time.	OK
	・Display only the gas type set for the cylinder.	OK
	・Reading is flashing in the standby state.	OK
	・If the AIR+MODE key is pressed and held in the standby state, exit the standby state.	OK
	・When the MODE key is pressed in the standby state, auto calibration determination processing is performed.	OK
	・"ADJ" shall be displayed during auto calibration.	OK
	・The gas species for which the calibration concentration value is set to OFF shall not be calibrated.	OK
	・When all gas species are successfully calibrated after completion of calibration, display success.	OK
	・After successful gas calibration, display the current concentration value after calibration.	OK
	・When even one gas type fails after calibration is completed, "FAIL" shall be displayed.	OK
	・When the remaining power value display setting is ON after the current concentration display after the calibration is completed, the remaining power value is displayed.	OK
	・When calibration is performed with gas which is not solvent gas (other than H2), if the calibration is successful only for B element during flammable calibration and the A element fails calibration, the flammable mode will be in limit mode.	OK
	・When calibrating with solvent gas, if calibration fails for A element, do not go into limit mode and make calibration failure.	OK
	・If calibration fails for B element when calibrating with H2 gas, make calibration failure.	OK
	・If the calibration gas is other than CH 4 or i-C4H10, do not display limit mode warning.	OK
	・When the flammable mode is the limit mode, the warning of the limit mode is displayed after the remaining power value is displayed.	OK
	・The limit mode warning is not cancelled until the MODE key is pressed.	OK
	・When flammable sensor is in limit mode, display limit mode in initial display.	OK
	・It is possible to calculate and record the span coefficient with 1 ch (combustible sensor) with the current sensor output as span output (1.6 mV to 8.0 mV).	OK
	・It is possible to calculate and record the span coeficient with 2 ch (oxygen sensor) with the current sensor output as span output (2000 mV to 2350 mV)	OK
	・It is possible to calculate and record the span coeficient using the current sensor output as span output with 3ch (H2S sensor) (H2S(ESR-A1DP): 20.9 mV to 300.92 mV, H2S(ESR-A13i): 36.18 mV to 520.98 mV)	OK
	・It is possible to record and record the span coeficient using the current sensor output as span output with 4 ch (CO sensor) (CO(ESR-A1DP): 34.97 mV to 503.56, CO(ESR-A1CP): 14.75 mV to 212.64 mV / 25.29 mV to 364.24 mV)	OK
	・After auto-calibration with 1ch (combustible sensor), the reading shall be the same as the calibration concentration value.	OK
	・After auto-calibration with 2ch (oxygen sensor), the reading shall be the same as the calibration concentration value.	OK
	・After auto-calibration with 3ch (H2S sensor), the reading shall be the same as the calibration concentration value.	OK
	・After auto-calibration with 4ch (CO sensor), the reading shall be the same as the calibration concentration value.	OK

fnc[5-4-2]	**Auto calibration concentration value setting**	OK
	・Press the MODE key when selecting the calibration concentration setting to shift to the gas type selection screen for calibration concentration setting.	OK
	Gas type selection screen	OK
	・Change the gas type set by the AIR key.	OK
	・Press the MODE key to transition to each setting screen.	OK
	・Short press of AIR+MODE key to change the display order of AIR key.	OK
	・Cancel by pressing and holding the AIR+MODE key and exit the item.	OK
	・Select 0ch(NC)→1ch(O2)→2ch(H2S)→3ch(CO)→ESCAPE.	OK
	・Unused gas species shall not be displayed.	OK
	Calibration concentration change screen	OK
	・Press the AIR key to change the calibration reading.	OK
	・When the AIR key is pressed and held, the change range of the calibration reading value becomes larger than that of the AIR key.	OK
	・Change the calibration indication from MIN to MAX within one minute.	OK
	・Off concentration can also be selected.	OK
	・Press the MODE key to change to the indicated value.	OK
	・Short press of AIR+MODE key to change the ascending/descending order of numerical values of AIR key.	OK
	・Cancel by pressing and holding the AIR+MODE key and exit the item.	OK
	・With 1ch (combustible sensor), OFF + calibration concentration setting upper and lower limits can be selected one digit at a time (1% LEL to 75% LEL).	OK
	・With 2ch (oxygen sensor), OFF + calibration concentration setting upper and lower limits can be selected one digit at a time (0% to 18.0%).	OK
	・With 3ch (H2S sensor), it is possible to select OFF + calibration concentration setting upper and lower limits one digit at a time (0.5 ppm to 200.0 ppm).	OK
	・With 4 ch (CO sensor), OFF + calibration concentration setting upper and lower limits can be selected one digit at a time (12 ppm to 2000 ppm).	OK
fnc[5-4-3]	**Auto calibration execution gas selection**	OK
	・Allow the AIR key to switch the auto calibration cylinder.	OK
	・Short press of AIR+MODE key to reverse the display order of AIR key.	OK
	・Press and hold the AIR+MODE key to exit the auto calibration gas selection.	OK
	・Press the MODE key to determine the cylinder.	OK
	・All cylinders with gas species for which calibration is valid shall be selectable.	OK
	・Indicate that gas species for which calibration is disabled as OFF.	OK
	・Cylinders without gas species for which calibration is effective cannot be selected.	OK
fnc[5-4-4]	**Auto calibration error diagnosis**	OK
	・If the span factor calculated in the auto-calibration is outside the calibration threshold, diagnose that the calibration gas is abnormal.	OK
	・In the case of calibration gas abnormality, the span factor calculated at that time shall be discarded.	OK
	・A failure alarm sounds if the result is FAIL.	OK
	・Press the MODE key to transition to the item before transition to auto calibration.	OK
	・Failure alarm shall be reset when the calibration error indication is exited.	OK
fnc[5-5-1]	**Calibration expiration check during initialization**	OK
	・The destination setting is not domestic but displayed only when the calibration deadline setting is ON.	OK
	・Otherwise disappear.	OK
	・If the calibration expiration date has passed, perform expiration processing.	OK
fnc[5-5-2]	**Operation setting on calibration expiration**	OK
	・Press the MODE key in the calibration expiration setting item to enter the calibration expiration operation setting.	OK
	・Press AIR to switch [CONFIRM/CANT USE/NONE].	OK
	・Press AIR+MODE key briefly to change the display order of AIR keys.	OK
	・If you press and hold AIR+MODE key, exit the calibration expiration setting without changing the setting.	OK
	・Press the MODE key to record the selected settings.	OK
	・Check for calibration when the expiration date has passed when set to CONFIRM.	OK
	・If the the expiration date has passed when CANT USE is set, the system cannot be started unless calibration is performed.	OK
	・When the setting is NONE, do nothing beyond the expiration date.	OK
fnc[5-5-3]	**Operation processing on calibration expiration**	OK
	Expiration confirmation	OK
	・Press the MODE key to switch to the auto calibration menu.	OK

	・Press AIR to continue initialization.	OK
	Expired unavailable	OK
	・When you press the MODE key or after 6 seconds have passed, the auto calibration menu is displayed.	OK
	・Pressing the AIR key has no response.	OK
	Expired, do nothing	OK
	・Press the MODE key to switch to the auto calibration menu.	OK
	・Pressing the AIR key has no response.	OK
	・Continue initialization after 6 seconds without operation.	OK
fnc[5-5-4]	**Calibration expiration display**	OK
	・In the calibration expiration check, in the case of expiration check setting, expiration check display shall be displayed.	OK
	・In the calibration expiration check, if expiration is disabled, the expiration disabled indication shall be displayed.	OK
	・In the calibration expiration check, if the setting is not to expire or not to expire, it shall be displayed.	OK
fnc[5-5-5]	**Calibration expiration display ON/OFF**	OK
	・Press the MODE key in the calibration expiration setting item to enter the calibration expiration display setting.	OK
	・Press AIR to switch ON/OFF.	OK
	・Pressing and holding the AIR+MODE key does not record the setting, but exits the calibration expiration date display setting.	OK
	・When the setting is ON, the calibration expiration date shall be displayed at the start initialization.	OK
	・When the setting is OFF, the calibration expiration date shall not be displayed at the start initialization.	OK
fnc[5-5-6]	**Calibration expiration date setting**	OK
	・Press the MODE key in the calibration expiration setting item to enter the calibration expiration date setting.	OK
	・Press the AIR key to change the number of expiration dates.	OK
	・The number of days to expiration can be changed from 1 to 1000 days.	OK
	・If you press the AIR+MODE key for a short time, you can switch the direction of increase or decrease of the numerical value of the AIR key.	OK
	・If AIR+MODE key is pressed and held, the setting is not recorded and exits the calibration expiration date setting.	OK
	・Managing the calibration expiration date for a set number of days.	OK
fnc[5-6-1]	**Initial time BUMP Expiration Check**	OK
	・When the BUMP expiration setting is ON, display the BUMP expiration date.	OK
	・Skip BUMP expiration display when BUMP expiration setting is OFF	OK
fnc[5-6-2]	**BUMP expiration check during initialization**	OK
	・BUMP expiration date is displayed only when ON.	OK
	・Otherwise disappear.	OK
	・If the BUMP expiration date has been exceeded, the expiration shall be handled.	OK
fnc[5-6-3]	**Operation setting on BUMP expiration**	OK
	・Press the MODE key in the BUMP expiration setting item to enter the BUMP expiration operation setting.	OK
	・Press AIR to switch [CONFIRM/CANT USE/NONE].	OK
	・Press AIR+MODE key briefly to change the display order of AIR keys.	OK
	・If the AIR+MODE key is pressed and held, exit the BUMP expiration setting without changing the setting.	OK
	・Press the MODE key to record the selected settings.	OK
	・Check the BUMP test if the expiration date has passed when the setting is CONFIRM.	OK
	・When the setting isCANT USE and the expiration date has passed, the BUMP test must be executed before starting.	OK
	・When the setting is NONE, do nothing beyond the expiration date.	OK
	BUMP expiration operation processing	OK
	Expiration confirmation	OK
	・Press the MODE key to switch to the BUMP test menu.	OK
	・Press AIR to continue initialization.	OK
	Expired unavailable	OK
	・When you press the MODE key or after 6 seconds have passed, the BUMP test menu is displayed.	OK
	・Pressing the AIR key has no response.	OK
	Expired, do nothing	OK
	・Press the MODE key to switch to the BUMP test menu.	OK
	・Pressing the AIR key has no response.	OK
	・Continue initialization after 6 seconds without operation.	OK
fnc[5-6-4]	**Bump expiration display**	OK

	・BUMP expiration check shall be displayed when expiration check is set.	OK
	・In BUMP expiration check, when expiration is disabled, expiration disabled display shall be displayed.	OK
	・In the BUMP expiration confirmation, if the expiration is set to do nothing, the expiration will be displayed as nothing.	OK
	・If the BUMP expiration date has not expired, display the "✓" mark on the LCD.	OK
	・If the BUMP expiration date has expired, the "✓" mark on the LCD shall not be displayed.	OK
fnc[5-6-5]	**BUMP expiration display ON/OFF setting**	OK
	・Press the MODE key in the BUMP expiration setting item to enter the BUMP expiration setting.	OK
	・Press AIR to switch ON/OFF.	OK
	・Press and hold the AIR+MODE key to exit the BUMP expiration date display setting without recording the setting.	OK
	・When the setting is ON, the BUMP expiration date is displayed at the start initialization.	OK
	・When the setting is OFF, the BUMP expiration date shall not be displayed at the start initialization.	OK
fnc[5-6-6]	**BUMP expiration date setting**	OK
	・Press the MODE key in the BUMP expiration setting item to enter the BUMP expiration date setting.	OK
	・Press the AIR key to change the number of expiration dates.	OK
	・The number of days to expiration can be changed from 0 to 365 days.	OK
	・If you press the AIR+MODE key for a short time, you can switch the direction of increase or decrease of the numerical value of the AIR key.	OK
	・Press and hold the AIR+MODE key to exit the BUMP expiration date setting without recording the setting.	OK
	・Managing BUMP expiration dates for a set number of days.	OK

fnc[5-7-1]	**Maintenance expiration check during initialization**	OK
	・It is displayed only when the destination setting is domestic, maintenance time limit setting is ON.	OK
	・Otherwise disappear.	OK
	・If the maintenance expiration date has been exceeded, expiration shall be handled.	OK
fnc[5-7-2]	**Operation setting on maintenance expiration**	OK
	・Press the MODE key in the maintenance expiration operation setting item to enter the maintenance expiration operation setting.	OK
	・Press AIR to switch [CONFIRM/CANT USE/NONE].	OK
	・Press AIR+MODE key briefly to change the display order of AIR keys.	OK
	・If the AIR+MODE key is pressed and held, exit the maintenance expiration setting without changing the setting.	OK
	・Press the MODE key to record the selected settings.	OK
	・Confirm the presence or absence of maintenance tests when the setting exceeds the expiration date when CONFIRM.	OK
	・If the setting exceeds the expiration date when CANT USE is set, the system cannot be started unless maintenance test is performed.	OK
	・When the setting is NONE, do nothing beyond the expiration date.	OK
fnc[5-7-3]	**Operation processing on maintenance expiration**	OK
	Expiration confirmation	OK
	・Press AIR to continue initialization.	OK
	Expired unavailable	OK
	・Pressing the AIR key has no response.	OK
	Expired, do nothing	OK
	・Pressing the AIR key has no response.	OK
	・Continue initialization after 6 seconds without operation.	OK
fnc[5-7-4]	**Maintenance expiration display**	OK
	・In the maintenance expiration check, when the expiration check setting is set, the expiration check display shall be displayed.	OK
	・When maintenance expiration is confirmed and expiration is disabled, expiration is indicated.	OK
	・In the maintenance expiration check, if it is set not to expire or not to expire, it shall be displayed.	OK
fnc[5-7-5]	**Maintenance expiration display ON/OFF setting**	OK
	・Press the MODE key in the maintenance expiration setting item to enter the maintenance expiration display setting.	OK
	・Press AIR to switch ON/OFF.	OK
	・Pressing and holding the AIR+MODE key does not record the settings, but allows the maintenance expiration date display settings to be exited.	OK
	・When the setting is ON, the maintenance expiration date is displayed at the start initialization.	OK
	・When the setting is OFF, the maintenance expiration date shall not be displayed at the start initialization.	OK
fnc[5-7-6]	**Maintenance expiration date setting**	OK
	・Press the MODE key in the maintenance expiration setting item to enter the maintenance expiration date setting.	OK
	・Press the AIR key to change the number of expiration dates.	OK
	・The number of days to expiration can be changed from 1 to 1000 days.	OK
	・If you press the AIR+MODE key for a short time, you can switch the direction of increase or decrease of the numerical value of the AIR key.	OK
	・Press and hold the AIR+MODE key. Do not record the setting and exit the maintenance expiration date setting.	OK
	・Managing the maintenance expiration date for a set number of days.	OK
	Maintenance expiration date reset	OK
	・Press the MODE key in the maintenance expiration date reset item to enter the maintenance expiration date reset.	OK
	・Reset by pressing the MODE key.	OK
	・Press the AIR key to exit the daily reset item without resetting.	OK
	・If the AIR+MODE key is pressed and held, the number of days reset item should not be reset.	OK
	・Reset updates the maintenance date to the current date.	OK

fnc[5-8-1]	**Sensor combination setting**	OK
	･Press the MODE key in the Sensor Combination Settings item to enter Sensor Combination Settings.	OK
	･To change the channel to be set by pressing the AIR key.	OK
	･Press AIR+MODE key briefly to switch the AIR key selection direction.	OK
	･Press and hold the AIR+MODE key to exit the sensor combination setting item.	OK
	･Press the MODE key while ESCAPE is selected to exit the sensor combination setting item.	OK
	･Press the MODE key while selecting 0-3ch to transition to the measurement gas selection setting.	OK
	･If gas setting is ON, display gas name and unit if LCD restrictions allow.	OK
	･Display "----" when gas setting is OFF.	OK
	･4 channels, 0ch to 3ch, can be set.	OK
fnc[5-8-2]	**Sensor ON/OFF setting**	OK
	･Select "----------" in the measurement gas selection setting to turn off the currently set channel.	OK
	･Select a gas other than "------------" to set ch to ON.	OK
fnc[5-8-3]	**Measurement gas selection setting**	OK
	･Press the AIR key to change the name of the selected measurement gas.	OK
	･Press AIR+MODE key briefly to switch the AIR key selection direction.	OK
	･Press and hold the AIR+MODE key to exit the measurement gas selection setting item without changing the setting.	OK
	･Press the MODE key to change the setting to the selected measurement gas name.	OK
	･If 2ch is set to single-component H2S, it cannot coexist, so automatically turn 3ch off.	OK
	･Setting 2ch to CO-H2 H2 automatically sets 3ch to CO-H2 CO for combination fixing.	OK
	･If 2ch is set to CO-H2 H2, give priority to CO-H2 CO of 3ch and fail to select 2ch.	OK
	･When 3ch is set to CO-H2 CO, the 2ch is automatically set to CH-H2 H2 because the combination is fixed.	OK
fnc[5-8-4]	**Zero tracking ON/OFF setting**	OK
	･Zero tracking after concentration calculation according to ON/OFF setting of zero tracking.	OK
	Zero tracking ON/OFF setting	OK
	･Can be set for gas species other than oxygen.	OK
	･Oxygen cannot be selected.	OK
	･Transition to the zero tracking ON/OFF setting item by pressing the MODE key in the zero tracking ON/OFF setting item.	OK
	･Press AIR key to switch the gas type to be set and ESCAPE.	OK
	･Press the AIR+MODE key briefly to reverse the selection order of the AIR key.	OK
	･Press and hold the AIR+MODE key to exit the zero tracking ON/OFF setting item.	OK
	･Press the MODE key when ESCAPE is selected to exit the zero tracking ON/OFF setting item.	OK
	･Press the MODE key when selecting a gas type to transition to zero tracking ON/OFF setting for each gas type.	OK
	Zero tracking ON/OFF setting for each gas type	OK
	･Press AIR to switch ON/OFF.	OK
	･Press and hold the AIR+MODE key to clear the zero tracking ON/OFF setting for each gas type without recording the setting.	OK
	･Press the MODE key to record the settings and transition to zero track ON/OFF settings.	OK
	ON/OFF setting to display zero tracking ON/OFF setting in user mode	OK
	･Press AIR to switch ON/OFF	OK
	･Press and hold the AIR+MODE key to exit the ON/OFF setting without recording the setting.	OK
	･Press the MODE key to exit the ON/OFF setting to record and represent the setting.	OK
fnc[5-8-5]	**Suppress ON/OFF setting**	OK
	･Suppress after concentration calculation according to ON/OFF setting of the suppressor.	OK
	Suppress ON/OFF setting	OK
	･By pressing the MODE key in the suppression ON / OFF setting item, you can switch to the suppression ON / OFF setting item.	OK
	･When you press the AIR key, you can switch the type of gas to be set and ESCAPE	OK
	･Short press the AIR + MODE key to invert the selection order of the AIR key.	OK
	･Press and hold the AIR + MODE key to exit the suppression ON / OFF setting item	OK
	･By pressing the MODE key when ESCAPE is selected, it is possible to exit the suppression ON / OFF setting item.	OK
	･Pressing the MODE key at the time of selecting the gas type makes transition to the suppression ON / OFF setting of each gas type.	OK
	Press ON/OFF setting for each gas type	OK
	･Press AIR to switch ON/OFF.	OK

		・Press and hold the AIR+MODE key to clear the press ON/OFF setting for each gas type without recording the setting.	OK
		・Press the MODE key to record the settings and transition to the Suppress ON/OFF setting.	OK
		ON/OFF setting whether to display the Suppress ON/OFF setting in user mode	OK
		・Press AIR to switch ON/OFF	OK
		・Press and hold the AIR+MODE key to exit the ON/OFF setting without recording the setting.	OK
		・Press the MODE key to exit the ON/OFF setting to record and represent the setting.	OK

Request number	Function number	Check Item	Judgment
req[6]	fnc[6-1-1]	**Manual backlight processing**	OK
		・In the measurement mode and display mode, the backlight is turned off when the set time elapses after the lighting event.	OK
		・When the backlight time setting is OFF (0 seconds), do not turn on the backlight in the above mode.	OK
		・In cases other than the measurement mode and the display mode, the backlight should remain on at all times.	OK
		・When any key is pressed, light processing is performed and the elapsed time is reset.	OK
		・In communication mode, turn off the backlight when connected to the other party.	OK
		・In communication mode, turn on the backlight when not connected to the other party.	OK
		・When the EX command is received, forcibly turn on the backlight.	OK
		・ When receiving an EX command, keep the backlight on at all times except when the power is off.	OK
		・ Even if the stealth function is ON, turn on the backlight when the EX command is received.	OK
	fnc[6-1-2]	**Manual backlight setting**	OK
		・Setting the backlight lighting time.	OK
		・Allow the AIR key to change the lighting time.	OK
		・The lighting time can be changed from [OFF,1～255] seconds.	OK
		・Record the setting with the MODE key and exit the setting item.	OK
		・Short press of AIR+MODE key should change the direction of increase or decrease of AIR key number.	OK
		・Cancel by pressing and holding the AIR+MODE key and exit the item without recording the setting.	OK
		・The backlight lights up for the set lighting time.	OK

fnc[6-2-1]	**Key operation sound processing**	OK
	Key operation sound ON/OFF setting: ON	OK
	･If there is an event when pressing the key, sound the operation tone.	OK
	･If there is no event when pressing the key, do not sound the operation sound.	OK
	Key operation sound ON/OFF setting: OFF	OK
	･Do not sound the operation sound.	OK
	･Operating sound at startup mode transition shall be sounded regardless of ON/OFF setting.	OK
	･When all lights are turned on at startup, the buzzer should be sounded regardless of the ON/OFF setting for confirmation.	OK
fnc[6-2-2]	**Key operation sound ON/OFF setting**	OK
	･Allow the AIR key to change [ON/OFF].	OK
	･Record the setting with the MODE key and exit the setting item.	OK
	･Cancel by pressing and holding the AIR+MODE key and exit the item without recording the setting.	OK
fnc[6-3-1]	**Confirmation beep processing**	OK
	･Operation according to the operation setting of Conformation Beep ON/OFF.	OK
	･Operate every specified time according to the time setting of the Conformation Beep ON/OFF setting.	OK
	･Operation only in measurement mode and display mode.	OK
	･Do not operate in measurement mode or display mode.	OK
	Conformation operation setting: OFF setting	OK
	･Do not perform confirmation beep processing.	OK
	Conformation operation setting: LED setting	OK
	･Operating only the vibration motor and the LED.	OK
	･Buzzer shall not operate.	OK
	Conformation operation setting: BUZZER setting	OK
	･Move only the vibration motor and buzzer.	OK
	･LED shall not operate.	OK
	Conformation operation setting: LED+BUZZ setting	OK
	･Vibration motor, LED and buzzer operate.	OK
	Conformation operation setting: BUMP/CAL setting	OK
	･ If both the calibration deadline and the bump deadline have not expired, it will not work.	OK
	･ It does not work when the calibration due date function and the bump due date function are OFF.	OK
	･ It works if the calibration deadline function or the bump deadline function is ON and has expired.	OK
	･ Operate independently of the “expiration operation setting” of the calibration deadline function and BUMP deadline function.	OK
	･ Operation is equivalent to BUMP / CAL / ALARM.	OK
	･ Stop condition is equivalent to BUMP / CAL / ALARM.	OK
	Confirmation operation setting: ALARM ALERT setting	OK
	･ Activate when negative over and any of all gas alarms are triggered.	OK
	･ Operation is equivalent to BUMP / CAL / ALARM.	OK
	･ Stop condition is equivalent to BUMP / CAL / ALARM.	OK
	Confirmation operation setting: BUMP / CAL / ALARM setting	OK
	･ LED only operates for 1 second.	OK
	･ Vibration motor and buzzer do not operate	OK
	･ Continuous operation until reset processing	OK
	･ Operate when it matches the condition of either BUMP / CAL or ALARM ALERT.	OK
	･ BUMP or calibration of all loaded gas species (except H_2 or H_2 compensated CO sensor) is successful, and stop when receiving history read completion command	OK
	･ The condition of “when receiving history read complete command” depends on ON / OFF.	OK
	･ Stop the operation when changing the confirmation operation setting.	OK
	･ Bump or calibration is not performed and reset is not performed even if history read complete command is received	OK
	･ It is not reset even if the power is turned off	OK
fnc[6-3-2]	**Confirmation beep ON/OFF setting**	OK
	･Conformation Beep Actions and Times.	OK
	Conformation operation setting	OK
	･Press the MODE key when selecting an operation setting item to transition to the operation setting.	OK
	･Change [OFF, LED, BUZZER, LED+BUZZ, BUMP/CAL, ALARM ALERT, BUMP/CAL/ALARM] by pressing the AIR key.	OK
	･Press the MODE key to record the selected settings and exit the operational settings.	OK
	･Short press of AIR+MODE key to change the selection order of AIR key.	OK
	･Cancel by pressing and holding AIR+MODE key, do not record settings, and exit the item.	OK

		Conformation time setting	OK
		･Press the MODE key when selecting a time setting item to transition to the time setting.	OK
		･Press the AIR key to change from 0.5 or 1 to 99 minutes.	OK
		･Press the MODE key to record the selected settings and exit the time setting.	OK
		･Short press of AIR+MODE key to change the increase or decrease of the numerical value of AIR key.	OK
		･Cancel by pressing and holding AIR+MODE key, do not record settings, and exit the item.	OK
		Confirmation download reset setting	OK
		・ Can not be set by key operation.	OK
		・ Can be turned on / off by communication command.	OK

fnc[6-4-1]	**Lunch break ON/OFF setting**	OK
	･Allow the AIR key to switch ON/OFF.	OK
	･Record the setting value with the MODE key and exit the lunchbreak ON/OFF setting.	OK
	･Cancel by pressing and holding AIR+MODE key, do not change the setting, and exit the item.	OK
	･When the lunchbreak ON/OFF setting is ON, the resume display is displayed during initialization.	OK
	･When the lunchbreak ON/OFF setting is OFF, resume display shall not be displayed during initialization.	OK
fnc[6-4-2]	**Lunch break record during power is off**	OK
	･Record the value to be used for the next resume in the FRAM when the power is turned off.	OK
	･Do not record a system error in FRAM/ROM/RAM.	OK
	･Recording only when the power is turned off during measurement or display mode.	OK
	･Do not record when the power is OFF except during measurement or display mode.	OK
	Data recorded for each gas	OK
	･Peak concentration values (MIN and MAX)	OK
	･Peak concentration sign flags (MIN and MAX)	OK
	･Peak occurrence times (MIN and MAX)	OK
	･Integrated value of the average value every 60 seconds	OK
	･Average total measurement time	OK
	･Total measurement time	OK
	･TWA value	OK
fnc[6-4-3]	**Resume selection**	OK
	･If the lunchbreak function is ON, confirm whether to execute resume processing at startup.	OK
	･During confirmation display, count down until automatic processing.	OK
	･Automatically resume after 5 seconds if no operation is performed during confirmation display.	OK
	･If the AIR key is pressed while the confirmation is displayed, do not execute resumption and clear it.	OK
	･Press the MODE key during confirmation display to execute resumption.	OK
	･If data reading fails during resumption, display failure.	OK
	･Notify a failure alarm during failure indication.	OK
	･Press the AIR or MODE key during failure display to transition to the following.	OK
	･Go to the next transition after resuming or clearing.	OK
fnc[6-4-4]	**Resume processing**	OK
	･Substituting the read data into each buffer according to the resume selection operation.	OK
	･Substituting the read data into each buffer just before the initialization completion.	OK
	･Initialize each buffer if cleared by Resume Selection.	OK
	Data to be substituted into each buffer for each gas	OK
	･Peak concentration values (MIN and MAX)	OK
	･Peak concentration sign flags (MIN and MAX)	OK
	･Peak occurrence times (MIN and MAX)	OK
	･Integrated value of the average value every 60 seconds	OK
	･Average total measurement time	OK
	･Total measurement time	OK
	･TWA value	OK
fnc[6-5-1]	**ID display ON/OFF setting**	OK
	･Allow the AIR key to switch ON/OFF.	OK
	･Record the setting value with the MODE key and exit the ID display ON/OFF setting.	OK
	･Cancel by pressing and holding AIR+MODE key, do not change the setting, and exit the item.	OK
	･User ID and station ID are displayed during initialization when ON/OFF setting is ON.	OK
	･When the ID display ON/OFF setting is OFF, the user ID and station ID shall not be displayed during initialization.	OK
fnc[6-5-2]	**Station ID setting**	OK
	･Press the AIR key in the Station ID display item to enter it in the Station ID setting item.	OK
	･To select the station ID by pressing the AIR key.	OK
	･128 station IDs can be selected.	OK
	･The station ID that can be selected is the same as the station ID set in the PC logger software.	OK
	･Press the MODE key to set the selected station ID and exit the setting item.	OK
	･Short press MODE+AIR to reverse the display order.	OK
	･Press and hold MODE+AIR to exit the setting item without recording the setting.	OK
fnc[6-5-3]	**User ID setting**	OK
	･Press the AIR key in the User ID display item to enter the user ID setting item.	OK
	･Select the user ID by pressing the AIR key.	OK
	･Selection of 128 user IDs.	OK
	･The user ID that can be selected is the same as the user ID set by the PC logger.	OK

		・Press the MODE key to set the user ID to the selected user ID and exit the setting item.	OK
		・Short press MODE+AIR to reverse the display order.	OK
		・Press and hold MODE+AIR to exit the setting item without recording the setting.	OK

fnc[6-6-1]	**Memory initialization**	OK
	・Press the MODE key when selecting the default processing item to transition to the default processing setting.	OK
	・Press the AIR key to not perform the default process, but to exit the process.	OK
	・Press the AIR+MODE key to perform default processing.	OK
	・Display "PASS" when the default processing is successful.	OK
	・If the default processing fails, "FAIL" shall be displayed.	OK
	・Display the result of default processing and exit the default processing setting item.	OK
	・Initializing data in non-volatile memory by performing default processing.	OK
	Initialization item	OK
	・Gas setting data	OK
	・Main unit setting data	OK
	・Logger data	OK
	・Station ID data	OK
	・User ID data	OK
fnc[6-6-2]	**Initialization of logger data**	OK
	・Initialization of logger data during default processing.	OK
	Initialization item	OK
	・Power log area	OK
	・Interval trend region	OK
	・Alarm trend area	OK
	・Alarm event area	OK
	・Fault event area	OK
	・Calibration history area	OK
	・Setting change history area	OK
	・Snap log area	OK
fnc[6-7-1]	**Protection setting for non-administrator**	OK
	・ON/OFF to display mode items.	OK
	・When the MODE key is pressed in the ON/OFF setting item of the setting item display, transition to the setting process is made.	OK
	・Change [ON/OFF] by pressing the AIR key.	OK
	・Press the MODE key to record settings and exit the item.	OK
	・Cancel by pressing and holding the AIR+MODE key, do not record settings, and exit the item.	OK
	・When setting is turned off, display mode setting items shall not be displayed.	OK
	・When setting is ON, the display mode setting items are displayed according to the display criteria.	OK
	When the setting is ON, the items displayed by each display criterion	OK
	・Flammable Change Gas Selection	OK
	・Flammable long energy setting item	OK
	・User ID setting item	OK
	・Station ID setting item	OK
fnc[6-8-1]	**User mode password authentication**	OK
	・For User Mode Security ON, transition to the Password display before user mode transition.	OK
	・In the case of User Mode Security OFF, the password screen should not be displayed and the user mode should be changed to User Mode.	OK
	・4-digit password can be entered.	OK
	・If the first to third digits are being set, move to the next digit with the MODE key.	OK
	・If the fourth digit is being set, the MODE key must confirm the password entry.	OK
	・Press the AIR key to change the number.	OK
	・Short press of the AIR+MODE key to change the increase or decrease of the numerical change of the AIR key.	OK
	・If the second to fourth digits are set, press AIR+MODE key to move to the previous digit.	OK
	・When setting the first digit, Press and hold the AIR+MODE key to do nothing.	OK
	・The digit being set flashes.	OK
	・0405 is accepted as password.	OK
	・Specified password to be accepted when ON/OFF is set.	OK
	・Automatically transition to the user mode after displaying password PASS.	OK
	・If the password is different, an error should display.	OK
	・Press the MODE key while displaying an error to transition to the initial mode.	OK

fnc[6-8-2]	**User mode security ON/OFF setting**	OK
	・Press the MODE key in the User Mode Security ON/OFF setting item to transition to the ON/OFF setting item.	OK
	ON/OFF setting item	OK
	・Allow the AIR key to switch ON/OFF.	OK
	・Record the setting value with the MODE key, and exit the setting item for OFF setting.	OK
	・Transition to the password setting item without recording the ON setting.	OK
	・Cancel by pressing and holding AIR+MODE key, do not change the setting, and exit the item.	OK
	Password setting item	OK
	・4-digit password can be set.	OK
	・If the first to third digits are being set, move to the next digit with the MODE key.	OK
	・If the fourth digit is set, confirm the input with the MODE key and record the ON/OFF setting and password number.	OK
	・Press the AIR key to change the number.	OK
	・Short press of the AIR+MODE key to change the increase or decrease of the numerical change of the AIR key.	OK
	・If the second to fourth digits are set, press AIR+MODE key to move to the previous digit.	OK
	・When setting the first digit, press and hold the AIR+MODE key to return to the ON/OFF setting item.	OK
fnc[6-8-3]	**Maintenance mode password authentication**	OK
	・For maintenance mode security ON, transition to the password screen before transition to maintenance mode.	OK
	・In the case of the maintenance mode security OFF, the password screen is not displayed and the operation mode is shifted to the maintenance mode.	OK
	・4-digit password can be entered.	OK
	・If the first to third digits are being set, move to the next digit with the MODE key.	OK
	・If the fourth digit is being set, the MODE key must confirm the password entry.	OK
	・Press the AIR key to change the number.	OK
	・Short press of the AIR+MODE key to change the increase or decrease of the numerical change of the AIR key.	OK
	・If the second to fourth digits are set, press AIR+MODE key to move to the previous digit.	OK
	・When setting the first digit, Press and hold the AIR+MODE key to do nothing.	OK
	・The digit under setting is flashing.	OK
	・2202 is accepted as password.	OK
	・Specified password to be accepted when ON/OFF is set.	OK
	・Automatically transition to the maintenance mode after displaying password pass.	OK
	・If the password is different, an error should display.	OK
	・Press the MODE key while displaying an error to transition to the initial mode.	OK
fnc[6-8-4]	**Maintenance mode security ON/OFF setting**	OK
	・Press the MODE key in the maintenance mode security ON/OFF setting item to transition to the ON/OFF setting item.	OK
	ON/OFF setting item	OK
	・Allow the AIR key to switch ON/OFF.	OK
	・Record the setting value with the MODE key, and exit the setting item for OFF setting.	OK
	・Transition to the password setting item without recording the ON setting.	OK
	・Cancel by pressing and holding AIR+MODE key, do not change the setting, and exit the item.	OK
	Password setting item	OK
	・4-digit password can be set.	OK
	・If the first to third digits are being set, move to the next digit with the MODE key.	OK
	・If the fourth digit is set, confirm the entry with the MODE key and record the ON/OFF password number.	OK
	・Press the AIR key to change the number.	OK
	・Short press of the AIR+MODE key to change the increase or decrease of the numerical change of the AIR key.	OK
	・If the second to fourth digits are set, press AIR+MODE key to move to the previous digit.	OK
	・When setting the first digit, Press and hold the AIR+MODE key to return to the ON/OFF setting item.	OK
fnc[6-8-5]	**Gas select mode password authentication**	OK
	・For gas select mode security ON, transition to the password screen before gas select mode transition.	OK
	・In the case of gas select mode security OFF, the password screen is not displayed and the mode is shifted to gas select mode.	OK
	・4-digit password can be entered.	OK
	・If the first to third digits are being set, move to the next digit with the MODE key.	OK
	・If the fourth digit is being set, the MODE key must confirm the password entry.	OK

		・Press the AIR key to change the number.	OK
		・Short press of the AIR+MODE key to change the increase or decrease of the numerical change of the AIR key.	OK
		・If the second to fourth digits are set, press AIR+MODE key to move to the previous digit.	OK
		・When setting the first digit, Press and hold the AIR+MODE key to do nothing.	OK
		・The digit being set flashes.	OK
		・2014 is accepted as password.	OK
		・Specified password to be accepted when ON/OFF is set.	OK
		・Automatically transition to the gas select mode after displaying password pass.	OK
		・If the password is different, the error display should be displayed.	OK
		・Press the MODE key while displaying an error to transition to the initial mode.	OK

fnc[6-8-6]	**Factory mode password authentication**	OK
	･For Factory Mode Security ON, transition to Password Screen before Factory Mode Transition.	OK
	･For Factory Mode Security OFF, the Password screen is not displayed and transition to Factory Mode shall be made.	OK
	･4-digit password can be entered.	OK
	･If the first to third digits are being set, move to the next digit with the MODE key.	OK
	･If the fourth digit is being set, the MODE key must confirm the password entry.	OK
	･Press the AIR key to change the number.	OK
	･Short press of the AIR+MODE key to change the increase or decrease of the numerical change of the AIR key.	OK
	･If the second to fourth digits are set, press AIR+MODE key to move to the previous digit.	OK
	･When setting the first digit, Press and hold the AIR+MODE key to do nothing.	OK
	･The digit being set flashes.	OK
	･1994 is accepted as password.	OK
	･Specified password to be accepted when ON/OFF is set.	OK
	･Automatically transition to the factory mode after displaying password pass.	OK
	･If the password is different, the error display should be displayed.	OK
	･Press the MODE key while displaying an error to transition to the initial mode.	OK
fnc[6-9-1]	**Power OFF execution confirmation password authentication**	OK
	･When password protection setting is ON, the password screen is displayed.	OK
	･The password screen is displayed in the initial mode, the measurement mode, and the display mode.	OK
	･Execute normal power OFF when other than the initial mode, measurement mode, and display mode.	OK
	･When Password Protection Setting is OFF, do not display the password screen and execute normal power OFF.	OK
	･4-digit password can be entered.	OK
	･If the first to third digits are being set, move to the next digit with the MODE key.	OK
	･If the fourth digit is being set, the MODE key must confirm the password entry.	OK
	･Press the AIR key to change the number.	OK
	･Short press of the AIR+MODE key to change the increase or decrease of the numerical change of the AIR key.	OK
	･If the second to fourth digits are set, press AIR+MODE key to move to the previous digit.	OK
	･When setting the first digit, Press and hold the AIR+MODE key to do nothing.	OK
	･The digit being set flashes.	OK
	･0405 is accepted as password and unit powers off.	OK
	･User password is accepted and unit powers off.	OK
	･If the password is different, an error should display.	OK
	･If 40 seconds elapse during password entry, the same transition process as after error display is performed.	OK
	･If 40 seconds elapse while the error is displayed, the same transition process as the operation when the MODE key is pressed is performed.	OK
	･Pressing the MODE key while error is displaying causes the initial mode to transition to the beginning of the initial mode.	OK
	･Press the MODE key during error display to transition to measurement mode when in measurement mode.	OK
	･Press the MODE key during error display to transition to measurement mode when in display mode.	OK
fnc[6-9-2]	**Demand zero execution confirmation password authentication**	OK
	･When Password Protection Setting is ON, the Password Screen is displayed when zero demand is set.	OK
	･If password protection setting is OFF, do not display the password screen and execute demand zero.	OK
	･4-digit password can be entered.	OK
	･If the first to third digits are being set, move to the next digit with the MODE key.	OK
	･If the fourth digit is being set, the MODE key must confirm the password entry.	OK
	･Press the AIR key to change the number.	OK
	･Short press of the AIR+MODE key to change the increase or decrease of the numerical change of the AIR key.	OK
	･If the second to fourth digits are set, press AIR+MODE key to move to the previous digit.	OK
	･When setting the first digit, Press and hold the AIR+MODE key to do nothing.	OK
	･The digit being set flashes.	OK
	･0405 is accepted as password and demand zero executes.	OK
	･User password is accepted as password and demand zero executes.	OK
	･If the password is different, an error should display.	OK
	･If 40 seconds elapse during password entry, the same transition process as after error display is performed.	OK

	･If 40 seconds elapse while the error is displayed, the same transition process as the operation when the MODE key is pressed is performed.	OK
	･Press the MODE key during error display to switch to measurement mode.	OK

fnc[6-9-3]	**Alarm reset execution confirmation password authentication**	OK
	・When password protection setting is ON, the password screen is displayed when alarm reset execution.	OK
	・If the password protection setting is OFF, do not display the password screen and execute alarm reset.	OK
	・4-digit password can be entered.	OK
	・If the first to third digits are being set, move to the next digit with the MODE key.	OK
	・If the fourth digit is being set, the MODE key must confirm the password entry.	OK
	・Press the AIR key to change the number.	OK
	・Short press of the AIR+MODE key to change the increase or decrease of the numerical change of the AIR key.	OK
	・If the second to fourth digits are set, press AIR+MODE key to move to the previous digit.	OK
	・When setting the first digit, press and hold the AIR+MODE key to do nothing.	OK
	・The digit being set flashes.	OK
	・0405 is accepted as password and alarm reset executes.	OK
	・User password is accepted as password and alarm reset executes.	OK
	・If the password is different, an error should display.	OK
	・If 40 seconds elapse during password entry, the same transition process as after error display is performed.	OK
	・If 40 seconds elapse while the error is displayed, the same transition process as the operation when the MODE key is pressed is performed.	OK
	・Press the MODE key during error display to switch to measurement mode.	OK
fnc[6-10-1]	**Factory setting record**	OK
	・Press the MODE key on the record confirmation screen to transition to the record reconfirmation screen.	OK
	・Press the AIR key on the record confirmation screen to exit the factory setting record item without recording.	OK
	・If the MODE key is pressed on the record reverification screen, the record is stored in the factory defaultconfiguration area.	OK
	・If the AIR key is pressed on the record reverification screen, nothing is stored in the factory default configuration area and exits the factory default configuration area.	OK
	・Records the current device settings in the factory configuration area.	OK
	・Records the alarm point for resetting the gas alarm point.	OK
fnc[6-10-2]	**Factory setting read**	OK
	・Press the MODE key on the Read Confirm screen to transition to the recall reverification screen.	OK
	・Press the AIR key on the Read Confirm screen to exit the factory default recall item without recalling anything.	OK
	・Press the MODE key on the Read Reverification screen to read the data into the factory default setting area.	OK
	・Press the AIR key on the reading reconfirmation screen to exit the factory configuration recall item without recalling anything.	OK
	・Data in the Read/Factory Setting Area shall be overwritten with the current device setting value.	OK
	・Alarm points for resetting gas alarm points at the time of reading shall also be overwritten at the time of factoryshipment.	OK
fnc[6-10-3]	**Serial number input**	OK
	・Enter serial number by communication command.	OK
	・Reading serial numbers by communication command.	OK
	・Writing and reading serial numbers shall be 20 characters.	OK
fnc[6-10-4]	**Temporary serial number input**	OK
	・Enter temporary serial number by communication command.	OK
	・Read temporary serial number by communication command.	OK
	・The temporary serial number must be written and read with 20 characters.	OK
fnc[6-10-5]	**SPE number input**	OK
	・Enter SPE number by communication command.	OK
	・Reading the SPE number by communication command.	OK
	・Writing and reading SPE numbers shall be 10 characters.	OK
fnc[6-10-6]	**Destination setting**	OK
	・Setting of destination settings by communication command.	OK
	・Reading of destination settings by communication command.	OK
	・Destination setting can be set in Domestic / Export General / OEM.	OK
fnc[6-11-1]	**Power supply activation processing**	OK
	・Press the MODE key for 3 seconds to shift to the initial mode.	OK
	・Press the AIR+MODE key for 3 seconds to transition to user mode when the user path is OFF.	OK

		･Press the AIR+MODE key for 3 seconds to transition to the user mode path input when the user path is ON.	OK
		･Press AIR+MODE key for 6 seconds to transition to maintenance mode when maintenance path is OFF.	OK
		･Press the AIR+MODE key for 6 seconds to transition to the maintenance mode path input when the maintenance path is ON.	OK
		･Press the AIR+MODE key for 9 seconds to transition to the path input for gas select mode/factory mode.	OK
	fnc[6-11-2]	**Power supply stop processing**	OK
		･Press the MODE key for 4 seconds to turn off the power.	OK
		･Press the MODE key for 1 second or longer to display the power OFF display.	OK
		･Turn off the power by To separating all keys when turning off the power.	OK
		･Do not turn off the power until all keys are released.	OK
		･Wait without turning off the power until processing of non-volatile memory or logger is completed.	OK

Request number	Function number	Check Item	Judgment
req[7]	fnc[7-1-1]	**Communication processing**	OK
		・Enabling all commands/subcommands during communication mode.	OK
		・For modes other than communication mode (except for system-related failures), the command request shall not be accepted.	OK
		・USB communication shall be possible in the event of a system-related failure.	OK
		・When connecting to a device that can communicate with a USB cable, the device can recognize the other party of the USB communication.	OK
		・During communication, if there is no USB communication partner with which communication is possible, it is recognized that there is no USB communication partner.	OK
		・Proper SUM calculation of communication commands.	OK
		・Communication command shall operate properly.	OK
		Communication command	OK
		Gas information related commands	OK
		・GJ command operates normally (gas information).	OK
		・LI command operates normally (gas table information).	OK
		・LP command operates normally (flammability change setting).	OK
		Alarm point related commands	OK
		・A7 command operates normally (alarm point).	OK
		・B9 command operates normally (alarm point settable range).	OK
		・B8 command operates normally (STEL configurable range).	OK
		・B7 command operates normally (TWA configurable range).	OK
		Calibration concentration related command	OK
		・SA command operates normally (CAL concentration).	OK
		・S4 command operates normally(CAL concentration settable range).	OK
		・LQ command operates normally (CAL group).	OK
		Calibration expiration date related command	OK
		・SO command operates normally (last calibration history).	OK
		・H1 command operates normally (final calibration history SDM serial).	OK
		・BO command operates normally (last BUMP history).	OK
		・H3 command operates normally (final BUMP history SDM serial).	OK
		・PS command operates normally (date and time of maintenance notice).	OK
		Coefficient-related commands	OK
		・SZ command operates normally (AIR calibration process).	OK
		・S2 command operates normally (SPAN calibration process).	OK
		Sensor information related commands	OK
		・W9 command operates normally (sensor/pump/battery replacement date and time).	OK
		Device information related commands	OK
		・IN command operates normally (serial number).	OK
		・HN command operates normally (temporary serial number).	OK
		・XZ command operates normally (user ID).	OK
		・XS command operates normally (station ID).	OK
		・BS command operates normally (SPE No).	OK
		・UJ command operates normally (destination setting).	OK
		LCD display related commands	OK
		・XT command operates normally (backlight lighting time).	OK
		Sensor-related commands	OK
		・US command operates normally (Suppress setting).	OK
		・UZ command operates normally (zero tracking setting).	OK
		・GT command operates normally (long life ON/OFF).	OK
		・GY command operates normally (Long life setting display ON / OFF)	OK
		・LJ command operates normally (flammable LEL number).	OK
		・LK command operates normally (Flammable sensor mode confirmation).	OK
		・PN command operates normally (power value display ON/OFF).	OK
		Alarm-related commands	OK
		・AP command operates normally (alarm operation).	OK
		・AM command operates normally (cumulative alarm ON/OFF).	OK
		・AF command operates normally (alarm function ON/OFF).	OK
		・B0 command operates normally (stealth setting).	OK

・XB command operates normally (Conformation Beep setting).	OK
・MX command operates normally (NCI history download)	OK
・MY command operates normally (NCI download setting)	OK
・MZ command operates normally (Acquire NCI active flag)	OK
Expiration date related command	OK
・SC command operates normally (calibration expiration date days).	OK
・SD command operates normally (calibration time ON/OFF).	OK
・SM command operates normally (calibration expiration operation).	OK
・BK command operates normally (the number of expiration date days for bump).	OK
・BJ command operates normally (bump expiration date ON/OFF).	OK
・BL command operates normally (bump expiration operation).	OK
・MR command operates normally (maintenance Notification setting).	OK
BUMP Condition Setting Commands	OK
・BU command operates normally (bump test condition setting).	OK
ON/OFF related command	OK
・XI command operates normally (ID display ON/OFF).	OK
・XL command operates normally (lunchbreak ON/OFF).	OK
・JZ command operates normally (key operation sound ON/OFF).	OK
・U8 command operates normally (DISP setting item ON/OFF).	OK
・SJ command operates normally (auto-zero ON/OFF).	OK
・SG command operates normally (demand zero ON/OFF).	OK
・OI command operates normally (automatic start ON/OFF after successful BUMP/CAL).	OK
・X8 command operates normally (pump stop screen display ON/OFF).	OK
・XA command operates normally (alarm silence ON/OFF).	OK
Password-related commands	OK
・MO command operates normally (USER password setting).	OK
・MP command operates normally (MAINTE password setting).	OK
・PG command operates normally (password protection ON/OFF).	OK
Logger function setting related commands	OK
・XP command operates normally (interval trend period).	OK
・XW command operates normally (overwrite ON/OFF).	OK
Other configuration commands	OK
・HC command operates normally (time).	OK
・VP command operates normally (main program number).	OK
・VQ command operates normally (sensor program number/SUM value/ver number).	OK
・VL command operates normally (gas table version number).	OK
・VS command operates normally (main program SUM value).	OK
・VT command operates normally (main program version number).	OK
・VV command operates normally (gas table SUM value).	OK
・UX command operates normally (default processing).	OK
・DW command operates normally (FRAM setting data update process).	OK
・EF command operates normally (FRAM memory dump process).	OK
・EP command operates normally (FLASH memory dump process).	OK
・XH command operates normally (data logger check data write process).	OK
・XC command operates normally (data logger data clear process).	OK
・XY command operates normally (clearing data logger power event).	OK
・G0 command operates normally (data logger start stop process).	OK
・FB command operates normally (factory default setting save/restore process).	OK
・AJ command operates normally (reset alarm point saving/restoring process).	OK
・LB command operates normally (lunchbreak save/restore process).	OK
Other processing commands	OK
・RO command operates normally (power OFF process).	OK
・D2 command operates normally (bump execution (concentration specification)).	OK
・D3 command operates normally (set fast bump execution record)	OK
・EX command operates normally (SDM display process).	OK
・WU command operates normally (FW rewrite start processing (main)).	OK
・W8 command operates normally (sensorMCU FW rewrite start).	OK
・93 command operates normally (sensorMCU FW rewritable status acquisition).	OK
・94 command operates normally (sensorMCU FW rewrite processing).	OK
・W0 command operates normally (FW rewrite operation mode).	OK
・90 command operates normally (FW rewrite start processing (main)).	OK

		・BP command operates normally (pump drive/stop processing).	OK
		・HF command operates normally (pressure sensor adjustment value setting processing).	OK
		・CP command operates normally (flow reduction threshold setting process).	OK
		Device information related commands	OK
		・DH command operates normally (concentration+status).	OK
		・DN command operates normally (concentration).	OK
		・DP command operates normally (peak concentration).	OK
		・HA command operates normally (A/D value).	OK
		・RC command operates normally (equipment connection check).	OK

		･RA command operates normally (alarm test).	OK
		･RM command operates normally (alarm check (for SDM)).	OK
		･KW command operates normally (acquisition of key operation status).	OK
		･RL command operates normally (LED light check).	OK
	fnc[7-1-2]	**Program rewrite**	OK
		･Transmitting the FW rewrite command (WU) to the FW rewrite mode of the main microcomputer.	OK
		･Transmitting the FW rewrite command (W8) causes the sensor microcomputer to transition to the FW rewrite mode.	OK
		･FW rewrite processing shall work correctly.	OK
		･Automatically power off at the end of FW rewrite.	OK

Request number	Function number	Check Item	Judgment
req[8]	fnc[8-1-1]	**Power logging**	OK
		・Recording the power log (ON) at power-on.	OK
		・Recording the power log (OFF) at power down.	OK
		・Up to 100 or more recordings.	OK
	fnc[8-1-2]	**Interval trend record**	OK
		・Recording Interval Trends at Set Interval Trend Time Intervals.	OK
		・The value recorded in the interval trend shall be the average value of the interval trend time interval.	OK
		・Interval trend concentration is correctly recorded.	OK
		・The header portion of the interval trend is correctly recorded.	OK
		・Overwrite correctly when Overwrite setting is ON.	OK
		・Do not overwrite even if Overwrite setting is ON when all areas are filled by one measurement.	OK
	fnc[8-1-3]	**Alarm trend record**	OK
		・Record the ±30-minutes concentration of the timing at which the alarm occurred at 5 second intervals.	OK
		・Even if another alarm is issued during alarm issuance, the alarm issued first shall be used as a	OK
		・The concentration to be recorded shall be the instantaneous value calculated 5 seconds.	OK
		・Concentration of alarm trends is correctly recorded.	OK
		・Alarm trend headers are correctly recorded.	OK
		・If 15 minutes have not elapsed from the start of measurement to the alarm, record the concentration from the start of measurement in the trend.	OK
		・Up to 8 alarm trends can be recorded.	OK
	fnc[8-1-4]	**Alarm event recording**	OK
		・Record the timing at which the gas alarm was issued, including the contents of the gas alarm.	OK
		・Record the timing at which the gas alarm was reset, including the contents of the reset.	OK
		・Correct recording of gas alarm events.	OK
		・Up to 100 or more recordings.	OK
	fnc[8-1-5]	**Fault event recording**	OK
		・Record the timing at which the failure alarm was issued, including the contents of the failure alarm.	OK
		・Record the timing at which the fault alarm was reset, including the contents of the reset.	OK
		・Correct recording of fault alarm events.	OK
		・Up to 100 or more recordings.	OK
	fnc[8-1-6]	**Calibration history record**	OK
		・Recording the calibrated timing, including calibration details.	OK
		・Correct record of calibration history.	OK
		・Record the timing of BUMP including calibration details.	OK
		・BUMP history record is correct.	OK
		・Up to 100 or more recordings.	OK
	fnc[8-1-7]	**Setting change history recording**	OK
		・Record in the setting change history when the setting is changed during each mode transition or power OFF.	OK
		・Recorded setting change history is correct.	OK
	fnc[8-1-8]	**Snap logging**	OK
		・Record the timing at which snap log recording is executed, including instantaneous values, etc.	OK
		・The record of the snap log is correct.	OK
		・A maximum of 256 records can be recorded.	OK
		・Can be viewed in the snap log data display in display mode.	OK
	fnc[8-1-9]	**Logger area write test**	OK
		・Dummy data write test of the logger area by execution from the communication command.	OK
		・Properly write dummy data in the program.	OK
	fnc[8-2-1]	**Data log clear**	OK
		・Clear all areas except the power log area by executing from the communication command. (0x10000～0xAFFFF).	OK
		・Do not clear the power logger.(0x00000～0x0FFFF).	OK
	fnc[8-2-2]	**Power log clear**	OK
		・Clear only the power log area by executing from the communication command.(0x00000～0x0FFFF).	OK
		・Do not clear areas other than the power log area.(0x10000～0xAFFFF).	OK
	fnc[8-3-1]	**Detailed fault log record**	OK
		・Recording the contents of a fault and the A/D value when a fault occurs.	OK
		・The contents of a fault shall be correctly recorded by a three-digit number.	OK
		・The A/D value at the time of failure shall be correctly recorded.	OK

	・Up to 100 or more recordings.	OK
fnc[8-4-1]	**Logger overwrite**	OK
	・When Overwrite setting is ON, correct overwrite after recording to the end of each area.	OK
	・When overwrite setting is OFF, overwrite should not be performed even if recording is performed up to the end of each area.	OK
fnc[8-4-2]	**Logger overwrite ON/OFF setting**	OK
	・Overwrite ON/OFF setting can be normally turned on by communication command.	OK
	・Overwrite ON/OFF setting can be normally turned off by communication command.	OK
	・Overwrite processing when setting is ON.	OK
	・Do not overwrite when setting is OFF.	OK
fnc[8-5-1]	**Set interval trend time**	OK
	・The interval trend time setting must be able to be set normally with a communication command.	OK
	・Interval Trend Operations as Time Interval.	OK
	・Can be set in 10/20/30/60/180/300/600 seconds.	OK
fnc[8-6-1]	**User ID record**	OK
	・The user ID is recorded in the header part of each logger data.	OK
	・The correct user ID is recorded.	OK

	fnc[8-7-1]	**Station ID record**	OK
		･Station ID is recorded in the header part of each logger data.	OK
		･The correct station ID is recorded.	OK

Request number	Function number	Check Item	Judgment
req[9]	fnc[9-1-1]	**Measurement mode**	OK
		･If a sensor disconnection (sensor error) occurs in the measurement mode, the operation other than power OFF is disabled.	OK
		･Short press of the MODE key to switch to the display mode.	OK
		･Press and hold the MODE key to turn off the power, and press and hold the MODE key to turn off the power to the main unit.	OK
		･Press and hold the AIR key to display air calibration, and press and hold the AIR key to execute demand air.	OK
		･When password protection is ON, the password is required before power is turned OFF.	OK
		･Password is required before air calibration when password protection is ON.	OK
		･If the password protection password is incorrect, do nothing and return to measurement mode.	OK
	fnc[9-1-2]	**All gas types concentration dispay during measurement**	OK
		･The current concentration is correctly displayed.	OK
		･When zero suppress setting is ON, the concentration display shall be suppressed.	OK
		･Concentration display shall not be suppressed when zero suppress setting is OFF.	OK
		･Concentration of H2 shall not be displayed for CO-H2 sensor.	OK
		･When H2 of CO-H2 is full scale over, alternate display of H2 and rich.	OK
		･Over display when the concentration exceeds F.S.	OK
		･If the concentration is F.S.≧concentration≧0, display the concentration as it is.	OK
		･When the concentration is negative designation, if 0> density ≧ -5% of the specified value, display the density as 0.	OK
		･When the concentration is negative designation, if -5% of the specified value> concentration ≧ 10% of the specified value, display the concentration as it is.	OK
		･If the concentration is negative designation, if it is -10% of the specified value> concentration, indicate minus over.	OK
		･The displayed unit is the same as the set unit.	OK
		･The displayed gas name is the same as the set gas name.	OK
		･If flammable gas is being read, the name of the gas being read is displayed below the LCD.	OK
		･When an alarm is issued, display the alarm level of the alarm.	OK
	fnc[9-2-1]	**Display mode operation transition**	OK
		･To switch items by pressing the MODE key.	OK
		･Press the MODE key in the last item to transition to measurement mode.	OK
		･Press the AIR key while selecting a configurable item to transition to each configuration change.	OK
		･If you press AIR while selecting an item that cannot be set, do nothing.	OK
		･If the AIR key is pressed and held while PEAK is displayed, the PEAK can be cleared.	OK
		･When password protection is ON, the PEAK cannot be cleared.	OK
		･Press and hold the MODE key to turn off the power, and press and hold the MODE key to turn off the power to the main unit.	OK
		･When password protection is ON, the password is required before power is turned OFF.	OK
		･If the password protection password is incorrect, do nothing and return to measurement mode.	OK
		Display mode item	OK
		･LED light on/off (Fixed to OFF when stealth mode is ON)	OK
		･PEAK display	OK
		･STEL display (with non-flammable sensor and oxygen sensor)	OK
		･TWA display (with non-combustible and oxygen sensors)	OK
		･Integration display (with CO installed and integration setting ON)	OK
		･Flammable gas selection (when flammable sensor is installed and display of display mode setting item is ON)	OK
		･Flammable long energy setting (when flammable sensor is installed and display of display mode setting item is ON)	OK
		･Pump OFF (when the pump setting display is ON)	OK
		･User ID display (ID display is ON and Disp mode setting item display is ON)	OK
		･Station ID display (ID display is ON and Disp mode setting item display is ON)	OK
		･Calibration record display (when calibration time limit setting is ON)	OK
		･BUMP record display (when BUMP expiration date setting is ON)	OK
		･Snap log display	OK
		･Date and time temperature display	OK
		･Alarm point display/alarm test	OK
	fnc[9-2-2]	**Display mode reset exit**	OK
		･Press and hold the AIR+MODE key to switch to measurement mode.	OK

fnc[9-2-3]	**Display mode 20 seconds exit**	OK
	･Transition to measurement mode when no operation is performed for 20 seconds.	OK
	･Transition to measurement mode when no operation is performed for 20 seconds during setting change.	OK

fnc[9-3-1]	**User mode**	OK
	･Press the AIR key to change the item being selected.	OK
	･Press AIR+MODE to reverse the AIR key selection order.	OK
	･Press the MODE key to transition to processing the selected item.	OK
	･Press the MODE key to switch to the initial mode if the "START" item is selected.	OK
	･During user mode, self-diagnosis other than battery voltage reduction shall not work.	OK
	User mode item	OK
	･Bump test	OK
	･Gas calibration	OK
	･Calibration deadline function setting (if destination setting is other than domestic)	OK
	･Bump expiration date function setting	OK
	･Gas alarm point setting	OK
	･Lunchbreak ON/OFF setting	OK
	･Conformation Beep setting	OK
	･LCD backlight ON time	OK
	･Key operation sound setting	OK
	･Display mode setting ON/OFF	OK
	･Suppress ON/OFF setting (when Suppress setting display is ON)	OK
	･Zero tracking ON/OFF setting (when zero tracking setting display is ON)	OK
	･Date setting	OK
	･User mode password setting	OK
	･ROM/SUM display	OK
	･Measurement start	OK
fnc[9-4-1]	**Maintenance mode**	OK
	･Press the AIR key to change the item being selected.	OK
	･Press AIR+MODE to reverse the AIR key selection order.	OK
	･Press the MODE key to transition to processing the selected item.	OK
	･Press the MODE key to switch to the initial mode if the "START" item is selected.	OK
	･During maintenance mode, self-diagnosis other than battery voltage reduction shall not work.	OK
	Maintenance mode item	OK
	･Gas calibration	OK
	･Gas test	OK
	･Sensor replacement date	OK
	･Bump test	OK
	･Gas alarm latching auto reset setting	OK
	･Alarm silence ON/OFF setting	OK
	･Demand zero ON/OFF setting	OK
	･Auto Zero ON/OFF	OK
	･ID display ON/OFF setting	OK
	･Maintenance announcement function setting (Destination setting is domestic setting)	OK
	･Suppress ON/OFF setting	OK
	･Zero tracking ON/OFF setting	OK
	･Suppress setting display ON/OFF	OK
	･Zero tracking setting display ON/OFF	OK
	･Pump setting display ON/OFF setting	OK
	･Date setting	OK
	･Maintenance mode password setting	OK
	･ROM/SUM display	OK
	･Flow reduction setting	OK
	･Factory return setting	OK
	･Measurement start	OK

fnc[9-5-1]	**Gas select mode**	OK
	･Press the AIR key to change the item being selected.	OK
	･Press AIR+MODE to reverse the AIR key selection order.	OK
	･Press the MODE key to transition to processing the selected item.	OK
	･Press the MODE key to switch to the initial mode if the "START" item is selected.	OK
	･During the gas select mode, self-diagnosis other than battery voltage reduction shall not be performed.	OK
	Gas select mode item	OK
	･Gas sensor combination setting	OK
	･Initial alarm point record	OK
	･Sensor reserve value display ON/OFF	OK
	･Stealth ON/OFF setting	OK
	･Flammable LEL value setting	OK
	･Measurement start	OK
fnc[9-6-1]	**Factory mode**	OK
	･Press the AIR key to change the item being selected.	OK
	･Press AIR+MODE to reverse the AIR key selection order.	OK
	･Press the MODE key to transition to processing the selected item.	OK
	･Press the MODE key to switch to the initial mode if the "START" item is selected.	OK
	･During factory mode, self-diagnosis other than battery voltage reduction shall not work.	OK
	Factory mode item	OK
	･Gas sensor combination setting	OK
	･Date setting	OK
	･ROM/SUM display	OK
	･A/D value display	OK
	･Flow reduction setting	OK
	･Factory shipment status record	OK
	･Default setting	OK
	･Measurement start	OK
fnc[9-7-1]	**Communication mode**	OK
	･When a USB connection partner is found while displaying the date and time or battery voltage in initial mode, the device automatically transitions to USB communication mode.	OK
	･Pressing the AIR+MODE key while displaying the date and time or battery voltage in the initial mode switches to the USB communication mode.	OK
	USB communication	OK
	･Turn off the backlight after connecting with the communication partner.	OK
	･Turn on the back light when not connected with the communication partner.	OK
	･Communication possibility through USB communication.	OK
	･To notify the trouble sound after 3 minutes without connecting with the communication partner.	OK
	･When communication is established, turn off the fault alarm automatically.	OK
	･Even if communication is disconnected, it is possible to reconnect with USB.	OK
	･Even if you disconnect communication once, if there is a partner, you can reconnect automatically.	OK
	･Transition other than power OFF is invalid.	OK

	fnc[9-7-2]	**SDM communication mode**	OK
		･When the main unit is turned off, the power is automatically turned on when the magnet is moved close to the main unit to shift to the SDM communication mode.	OK
		･Turn off the power automatically after 15 seconds when the USB communication partner is not present.	OK
		･Do not automatically turn off the power when the system is started and communication with the USB communication partner is established.	OK
		･USB communication capability.	OK
		･Turn off the backlight when connecting to the other party.	OK
		･Turn on the backlight when not connected to the other party.	OK
		･If there is no communication partner for 3 minutes or more after disconnection from the communication partner, issue a failure alarm.	OK
		･Automatically turn off failure alarm when communication is established.	OK
	fnc[9-8-1]	**Initial mode**	OK
		･Transition to Initial Mode at Normal Power Startup.	OK
		･Double buzzer tone when transitioning from the initial mode to the measurement mode.	OK
		･For items with only display, transition to the next item automatically after display.	OK
		･Even if the ON/OFF of the display is changed in addition to the resume function and the ID display, the initial time must be 40 seconds.	OK
		･When the resume function is OFF and the ID display is ON, the initial time shall be 43 seconds.	OK
		Initial item	OK
		･All screens at startup	OK
		･Resume display (when lunchbreak is ON)	OK
		･Maintenance Notification (When the maintenance notification is ON in the domestic specification)	OK
		･Calibration expiration display (when calibration expiration function is ON for settings other than domestic specifications)	OK
		･Bump expiration display (when bump expiration function is ON)	OK
		･Date and time display	OK
		･Battery voltage alarm operation display	OK
		･Combustible gas conversion restriction display	OK
		･Measurement gas name display	OK
		･Full-scale display	OK
		･1st alarm point display	OK
		･2nd alarm point display	OK
		･3rd alarm point display	OK
		･STEL Alerm Point Indication (When a sensor other than a combustible sensor and an oxygen sensor is	OK
		･TWA Alarm Point Indication (When a sensor other than a combustible sensor and an oxygen sensor is	OK
		･CO cumulative alarm point display (When the CO sensor is installed and the integration alarm is ON)	OK
		･User ID display (when ID display is ON)	OK
		･Station ID display (ID display ON)	OK
		･Auto zero calibration (when auto zero is ON)	OK
	fnc[9-9-1]	**Mode transition**	OK
		･Press the AIR+MODE key for 3 seconds to switch to the user mode or the password for the user mode at power-up.	OK
		･When the AIR+MODE key is pressed for 6 seconds when the power is turned on, transition to Maintenance Mode or Password for Measurement Mode is made.	OK
		･Press the AIR+MODE key for 9 seconds during power-up to switch to the password entry for gas select/factory mode.	OK
		･Transition to the initial mode when the user mode measurement start process is selected.	OK
		･Transition to the initial mode when the measurement start process in the maintenance mode is selected.	OK
		･Transition to the initial mode when the measurement start process in the gas select mode is selected.	OK
		･Transition to the initial mode when the measurement start process in the factory mode is selected.	OK
		･Transition to measurement mode if normal sensor is installed after initialization.	OK
		･Do not transition to measurement mode if all sensors are abnormal after initialization.	OK

Request number	Function number	Check Item	Judgment
req[10]	fnc[10-1-1]	**All lights on initialization**	OK
		・When transitioning to the initial mode, all lights are turned on to allow the user to confirm the buzzer operation.	OK
		・When transitioning to the initial mode, all lights are turned on and the user can confirm the LED operation.	OK
		・When transitioning to the initial mode, all lights are turned on and the user can check the operation of the vibration motor.	OK
		・When transitioning to the initial mode, all lights should be turned on so that the user can confirm the LCD operation.	OK
		・Sound the buzzer when all lights are on.	OK
		・Illuminate the LEDs during all lights on.	OK
		・Vibration of the vibration motor during all lights on.	OK
		・Illuminate all LCD dots.	OK
	fnc[10-2-1]	**Gas name display on initialization**	OK
		・Correct setting and display gas name.	OK
		・Display all gas names of measurement gas.	OK
		・Display all measurement gas units.	OK
		・If a flammable sensor is installed, display the name of the gas under the LCD if it is being read.	OK
		・For a flammable sensor other than CH4 and H2, display the detailed gas name below the LCD.	OK
		・Displaying the gas name in the concentration display area.	OK
	fnc[10-2-2]	**Full scale display on initialization**	OK
		・Correct settings and full scale.	OK
		・Display all gas names of measurement gas.	OK
		・Display all measurement gas units.	OK
		・Displaying the full-scale concentration in the concentration display area.	OK
		・Displaying Full Scale below the LCD.	OK
		・When the flammable LEL value setting is set to STANDARD, do not display the set value of LEL.	OK
		・When flammable LEL value setting is ISO setting, display it as ISO below the LCD.	OK
		・When the flammable LEL value setting is IEC setting, indicate IEC in the lower part of the LCD.	OK
	fnc[10-2-3]	**Latcing/Auto resety setting display on initialization**	OK
		・If the setting is latching, the latching display shall be displayed.	OK
		・If the setting is auto reset, the auto reset display shall be displayed.	OK
		・Display in battery voltage display item.	OK
	fnc[10-2-4]	**Alarm display on initialization**	OK
		・If the all alarm OFF setting is OFF, the 1st alarm point is displayed.	OK
		・The value of the 1st alarm point is the same as the set value.	OK
		・When the all alarm OFF setting is ON, the 1st alarm point is displayed as OFF.	OK
		・If the all alarm OFF setting is OFF, the 2nd alarm point shall be displayed.	OK
		・The 2nd alarm point value and the set value are the same.	OK
		・If the all alarm OFF setting is ON, the 2nd alarm point is displayed as OFF.	OK
		・If the all alarm OFF setting is OFF, the 3rd alarm point shall be displayed.	OK
		・The same value as the 3rd alarm point.	OK
		・When the all alarm OFF setting is ON, the 3rd alarm point is displayed as OFF.	OK
		・Display STEL value when toxicity sensor is installed and all alarm OFF setting is OFF.	OK
		・The value of the STEL alarm point is the same as the set value.	OK
		・When toxicity sensor is installed and all alarm OFF setting is ON, display STEL value as OFF.	OK
		・Do not display STEL when no toxicity sensor is installed.	OK
		・Display TWA value when toxicity sensor is installed and all alarm OFF setting is OFF.	OK
		・The same TWA alarm point value as the set value.	OK
		・When toxicity sensor is installed and all alarm OFF setting is ON, display TWA value as OFF.	OK
		・Do not display TWA when no toxicity sensor is installed.	OK
		・Display the integrated value when the CO sensor is installed, the integrated alarm is ON, and the total alarm OFF setting is OFF.	OK
		・The value of the cumulative alarm point is the same as the set value.	OK
		・When the CO sensor is installed and the integrated alarm is ON and the all alarm OFF setting is ON, the integrated value is displayed as OFF.	OK
		・Do not install the CO sensor, turn off the cumulative alarm, or display the cumulative display.	OK
	fnc[10-2-5]	**Alarm point display on display mode**	OK
		・Displaying the same alarm point as the alarm point at initial time.	OK
		・Press the AIR key to switch the alarm point type.	OK

	･Press the MODE key to exit the alarm point display item in display mode.	OK
	･Press the AIR+MODE key to sound the alarm being selected and test the alarm.	OK
	･Press the AIR key during the alarm test to stop the alarm test.	OK
	･Press the MODE key during the alarm test to stop the alarm test and exit the alarm point display item in the display mode.	OK
fnc[10-3-1]	**Date and time display on initialization**	OK
	･The set date and time and the displayed date and time are correct.	OK
	･Press the AIR+MODE key to switch to the communication mode.	OK

fnc[10-3-2]	**Time display during measurement**	OK
	・Displaying the time to the top of the LCD during measurement.	OK
	・The set time and the displayed time are correct.	OK
fnc[10-3-3]	**Date and time display in display mode**	OK
	・The set date and time and the displayed date and time are correct.	OK
	・Together with the date and time, the temperature value is also displayed.	OK
	・When equipped with NCR Display the temperature at -2 ° C from the temperature inside the microcomputer.	OK
fnc[10-3-4]	**Date and time setting**	OK
	・Press the AIR key to change the number.	OK
	・Press the MODE key to decide.	OK
	・Short press of the AIR+MODE key should change the display order of the AIR key.	OK
	・Press and hold the AIR+MODE key to return to the previous item.	OK
	・The date and time can be set in the order of year, month, day, hour, and minute.	OK
	・If you decide to use the MODE key while setting the minute, record the setting value and exit the date and time setting.	OK
	・If the AIR+MODE key is pressed and held while the year is set, the setting value is not recorded and the date and time setting can be exited.	OK
	・The items that can be set are flashing.	OK
	・Enabling valid date and time settings.	OK
	・Cannot be set for non-existing schedules.	OK
	・Accurately dealing with leap years.	OK
fnc[10-4-1]	**Battery voltage acquisition**	OK
	・Accurate battery voltage.	OK
	・The value obtained by multiplying the A / D value three times is taken as the battery voltage.	OK
fnc[10-4-2]	**Battery voltage display on initialization**	OK
	・The battery voltage displayed is correct.	OK
fnc[10-4-3]	**Battery level acquisition**	OK
	・Determine the remaining battery level from the acquired battery voltage.	OK
	・Correct battery voltage level.	OK
fnc[10-4-4]	**Battery level icon display**	OK
	・Displaying icons correctly from battery voltage level.	OK
	・At level 4, the icon (FULL) is correctly lit. 3850mV	OK
	・At level 3, the icon (NORMAL) is correctly lit. 3650mV	OK
	・At level 2, the icon (WARNING) is correctly lit. 3550mV	OK
	・When level 1, the icon (ALARM) is flashing correctly. 3400mV	OK

fnc[10-5-1]	**ROM number display**	OK
	･The same ROM number as that of the written program.	OK
	･ROM number is displayed in 5 digits.	OK
	･Press the MODE key to exit the ROM number display.	OK
	･Long press AIR+MODE key to exit the ROM number display.	OK
	･Pressing the AIR key has no response.	OK
	･The ROM numbers of the main microcomputer and the sensor microcomputer are displayed alternately.	OK
fnc[10-5-2]	**SUM number display**	OK
	･Same SUM value as that of the written program.	OK
	･The SUM value is displayed in four digits.	OK
	･Each time you transition to the display item, you must calculate the SUM value.	OK
	･Display "----" while calculating SUM value.	OK
	･Press the MODE key to exit the SUM value display.	OK
	･Press and hold AIR+MODE key to exit SUM value display.	OK
	･Pressing the AIR key has no response.	OK
	･The SUM values of the main microcomputer and the sensor microcomputer are alternately displayed.	OK
fnc[10-5-3]	**SUM value acquisition**	OK
	･The SUM value of the program is the same as the calculated SUM value.	OK
	･Performing SUM calculations should not affect other operations in the program.	OK
fnc[10-5-4]	**Version number display**	OK
	･The same version number as that of the written program.	OK
	･Version number is displayed in 5 digits.	OK
	･Press the MODE key to exit the version number display.	OK
	･Long press AIR+MODE key to exit the version number display.	OK
	･Pressing the AIR key has no response.	OK
	･The version numbers of the main microcomputer and the sensor microcomputer are displayed alternately.	OK
fnc[10-6-1]	**Station ID display**	OK
	･The same station ID as that set and displayed.	OK
fnc[10-6-2]	**User ID display**	OK
	･The same user ID as that set and displayed.	OK
fnc[10-7-1]	**A/D value display**	OK
	･To change the A/D value to be displayed by pressing the AIR key.	OK
	･To change the display order of AIR keys by pressing the AIR+MODE key briefly.	OK
	･Press and hold the AIR+MODE key to exit the A/D value display.	OK
	･Press the MODE key to exit the A/D value display.	OK
	Displayed item	OK
	･0. BAT/PS : Lithium ion battery voltage / Pressure sensor voltage	OK
	･1. OXH/L : O2(AMP_HI) sensor voltage / O2(AMP_LO) sensor voltage	OK
	･2. SV/MV : Power supply voltage (SV) / Power supply voltage (MV)	OK
	･3. ECV1/2 : Reference Voltage (ECV1) / Reference Voltage (ECV2)	OK
	･4. ECV3 : Reference voltage (ECV3)	OK
	･5. HCV/PZ : Combustible element voltage / PS_DAC output voltage	OK
	･6. NC0.1 : NC sensor 0.1 sec output (A element)	OK
	･7. NC0.5 : NC sensor 0.5 sec output (A element)	OK
	･8. NC1.0 : NC sensor 1.0 sec output (A element)	OK
	･9. NC1.1 : NC sensor 1.1 sec output (B element)	OK
	･A. NC1.5 : NC sensor 1.5 sec output (B element)	OK
	･B. NC2.0 : NC sensor 2.0 sec output (B element)	OK
	･C. E1 O2 : O2(AMP_LO) sensor output	OK
	･D. E2 CO : CO sensor output	OK
	･E. E3 H2S : H2S sensor output	OK
	･F. TEMP : Temperature sensor output (temperature value)	OK

Request number	Function number	Check Item	Judgment
req[11]	fnc[11-1-1]	**Temperature value display**	OK
		・ Displaying the temperature value in the date/time display portion of the display mode item.	OK
	fnc[11-1-2]	**Out of range used temperature warning**	OK
		・If the display temperature continues for 20 minutes outside the range of the use temperature range (-20 ° C to 50 ° C) ± 3 ° C, issue out of range used temperature warning.	OK
		・Displaying on the measurement screen "TMP.WARN" from 20 minutes to 1 hour after reaching the temperature outside the range.	OK
		・Displaying as "TEMP NG" after 1 hour from when it is out of range.	OK
		・While displaying, flicker and display the above display and current temperature.	OK
		・Reset alarm sound by key operation from outside the range for 1 hour.	OK
		・Repeat warning sound every 20 minutes from outside the range for 1 hour.	OK
		・The alarm sound can not be reset after 1 hour from outside the range.	OK
		・When the temperature returns within the using temperature range, it is automatically cancel the warning sound after 5 minutes.	OK
		・When the temperature returns within the using temperature range, Turn off display of warning outside use temperature range after 5 minutes.	OK
	fnc[11-2-1]	**Long energy operation**	OK
		・Operate only during measurement mode or display mode.	OK
		・Do not operate in measurement mode or display mode.	OK
		・When the long energy setting is ON, the NC sensor intermittent operation is changed to long life mode operation.	OK
		・When the long energy setting is ON and the sensor output is less than −10% LEL of F.S., −2 is performed, and the concentration is inverted and doubled.	OK
		・During AIR calibration, long energy operation is not performed.	OK
		・If the flammable sensor is warming up or is over full scale, long energy operation is not performed.	OK
	fnc[11-2-2]	**Long energy setting**	OK
		・Press AIR to change [ON/OFF].	OK
		・Press and hold the AIR+MODE key to exit the setting item without saving the setting changes.	OK
		・Press the MODE key to record settings and exit the settings.	OK
		・ When the display setting of the long energy setting is OFF, the long energy setting is not displayed.	OK
	fnc[11-2-3]	**Long energy display**	OK
		・If the long energy setting is ON, the L icon is displayed.	OK
		・When the long energy setting is OFF, the L icon is not displayed.	OK
	fnc[11-3-1]	**Sensor life acquisition**	OK
		・Calculation of sensor lifetime during auto-calibration.	OK
		・Calculating the maximum concentration that can be calibrated when the span factor is maximized based on the current sensor output.	OK
		・In the case of oxygen, the maximum AIR calibration concentration should be calculated based on the current sensor output and the AIR calibration output when the coefficient is maximized.	OK
		・The maximum sensor life value other than oxygen shall be a full-scale value of a calibration concentration value x 2 times as small as a calibration concentration value.	OK
		・Maximum oxygen sensor life value shall be 25.0%.	OK
	fnc[11-3-2]	**Sensor life display**	OK
		・Displaying the concentration of sensor life.	OK
		・Display only the gas species for which the auto-calibration was performed.	OK
		・Automatically terminate the display after a certain period of time.	OK

fnc[11-3-3]	**Sensor life display ON/OFF setting**	OK
	･Press AIR to change [ON/OFF].	OK
	･Press and hold the AIR+MODE key to exit the setting item without saving the setting changes.	OK
	･Press the MODE key to record settings and exit the settings.	OK
fnc[11-4-1]	**Stealth operation**	OK
	･Always turn off LCD backlight.	OK
	･Always stop buzzer operation.	OK
	･Always stop LED operation.	OK
	･When the vibration motor is set to OFF, stop the vibration motor at all times.	OK
	･When the vibration motor is set to ON, the normal operation of the vibration motor shall be performed.	OK
	･Display the stealth icon in measurement mode and display mode.	OK
fnc[11-4-2]	**Stealth mode ON/OFF setting**	OK
	ON/OFF setting of stealth function	OK
	･Press AIR to change [ON/OFF].	OK
	･Press and hold the AIR+MODE key to exit the setting item without saving the setting changes.	OK
	･Press the MODE key to shift to ON/OFF setting of the vibration motor.	OK
	ON/OFF setting of vibration motor	OK
	･Press AIR to change [ON/OFF].	OK
	･Press and hold the AIR+MODE key to shift to ON/OFF setting of the stealth function.	OK
	･Press the MODE key to record the settings and exit the settings.	OK
fnc[11-5-1]	**Combustible gas type conversion operation**	OK
	･Readable with the set gas type.	OK
	･The conversion factor of the set gas type is correctly used. CH4：100 i-C4H10：91 H2：105 CH3OH：55 C2H2：70 C2H4：120 C2H6：106 C2H5OH：51 C3H6：103 C3H6O：45 C3H8：89 C4H6：66 C5H10：69 C6H6：40 n-C6H14：53 C7H8：22 n-C7H16：32 C8H10：13 n-C9H20：11 EtAc：35 IPA：61 MEK：38 MMA：30 DME：86 MIBK：25 THF：43 n-C5H12：83	OK
	･The calibration curve of the set gas species is correctly used.	OK
	･In the limit mode when power is turned on, if the gas being read is CH3OH,C2H5OH,C3H6O,C6H6,C7H8,C8H10,C9H20,EtAc,IPA,MEK,MMA,DME,MIBK,THF, the replacement gas is returned to the calibration gas type about.	OK
	･Operate with calibration gas species in modes other than measurement mode and display mode even during reading.	OK
fnc[11-5-2]	**Combustible gas type conversion settings**	OK
	･Press the AIR key to change the gas name.	OK
	･Pressing the AIR+MODE key briefly reverses the order of selection of gas names for the AIR key.	OK
	･Press and hold the AIR+MODE key to exit the item without recording the settings.	OK
	･Press the MODE key to record the settings and exit the settings.	OK
	･Vol % of CH4 cannot be selected.	OK
	･The %LEL of CH4 and i-C4H10 shall be readable only for calibration gas species.	OK
	･In the case of calibration gas species other than %LEL of CH4 and i-C4H10, it shall not be possible to replace them.	OK
	･When i-C4H10 is a calibration gas type, CH4, C2H6, and C3H8 cannot be selected.	OK
	･Record the type of gas to be read even if the power supply to the equipment is turned off.	OK
fnc[11-5-3]	**Combustible gas type conversion gas name display**	OK
	･Display the name of the gas that was read under the measurement mode.	OK
fnc[11-6-1]	**Combustible gas LEL value switching operation**	OK
	･When set to STANDARD, calculate with the LEL value for STANDARD. CH4：50000ppm i-C4H10：18000ppm H2：40000ppm CH3OH：55000ppm C2H2：15000ppm C2H4：27000ppm C2H6：30000ppm C2H5OH：33000ppm C3H6：20000ppm C3H6O：21500ppm C3H8：20000ppm C4H6：11000ppm C5H10：14000ppm C6H6：12000ppm n-C6H14：12000ppm C7H8：12000ppm n-C7H16：11000ppm C8H10：10000ppm n-C9H20：7000ppm EtAc：21000ppm IPA：20000ppm MEK：18000ppm MMA：17000ppm DME：30000ppm MIBK：12000ppm THF：20000ppm n-C5H12：15000	OK
	･When set to ISO, calculate with LEL value for ISO. CH4：44000ppm i-C4H10：15000ppm H2：40000ppm CH3OH：60000ppm C2H2：23000ppm C2H4：24000ppm C2H6：24000ppm C2H5OH：31000ppm C3H6：18000ppm C3H6O：25000ppm C3H8：17000ppm C4H6：14000ppm C5H10：14000ppm C6H6：12000ppm n-C6H14：10000ppm C7H8：10000ppm n-C7H16：8000ppm C8H10：10000ppm n-C9H20：7000ppm EtAc：20000ppm IPA：20000ppm MEK：15000ppm MMA：17000ppm DME：27000ppm MIBK：12000ppm THF：15000ppm n-C5H12：11000	OK

		・When set to IEC, calculate with LEL value for IEC. CH4：44000ppm i-C4H10：13000ppm H2：40000ppm CH3OH：60000ppm C2H2：23000ppm C2H4：23000ppm C2H6：24000ppm C2H5OH：31000ppm C3H6：20000ppm C3H6O：25000ppm C3H8：17000ppm C4H6：14000ppm C5H10：14000ppm C6H6：12000ppm n-C6H14：10000ppm C7H8：10000ppm n-C7H16：8500ppm C8H10：10000ppm n-C9H20：7000ppm EtAc：20000ppm IPA：20000ppm MEK：15000ppm MMA：17000ppm DME：27000ppm MIBK：12000ppm THF：15000ppm n-C5H12：11000	OK
		・Even if the type of gas to be read is changed, use the LEL value of the type of gas to perform the calculation.	OK
		・Changing the LEL settings should not affect the zero point and span factor.	OK

	fnc[11-6-2]	**Combustible gas LEL value switching setting**	OK
		・Press the AIR key to change STD, ISO, and IEC.	OK
		・Pressing the AIR+MODE key briefly reverses the selection order of the AIR key.	OK
		・Press and hold the AIR+MODE key to exit the item without recording the settings.	OK
		・Press the MODE key to record the settings and exit the settings.	OK
	fnc[11-7-1]	**Calibration record display**	OK
		・When the calibration time limit function is OFF, do not display calibration record.	OK
		・Display calibration record when calibration expiration date function is ON.	OK
		・Press the AIR key to change the gas type to be displayed.	OK
		・ The setting value of the current gas type is correctly displayed.	OK
		・Calibrated date and displayed date are the same for all gas types.	OK
		・All gas types are displayed.	OK
		・Non-installed gas species shall not be displayed.	OK
	fnc[11-8-1]	**BUMP record display**	OK
		・When the BUMP expiration date function is OFF, do not display BUMP record.	OK
		・When the BUMP expiration date function is ON, display BUMP record.	OK
		・Press the AIR key to change the gas type to be displayed.	OK
		・BUMP date is the same for all gas types.	OK
		・All gas types are displayed.	OK
		・Non-installed gas species shall not be displayed.	OK
	fnc[11-9-1]	**Gas alarm point reset processing**	OK
		・After setting, overwrite the current alarm point with the reset alarm point.	OK
		・Reset all gas channel alarm points all at once.	OK
		・If there is a difference between the current gas setting and the gas setting of the reset alarm point, do not display the reset processing items.	OK
	fnc[11-9-2]	**Alarm point setting record for gas alarm point reset**	OK
		・Record the current alarm point as the reset alarm point when the setting is executed.	OK
		・Updating alarm points for resetting when recording factory settings.	OK
		・Setting alarm points for resetting alone shall be possible.	OK
		・The alarm point of the main body at the time of recording and the alarm point for resetting recorded are the same.	OK

Request number	Function number	Check Item	Judgment
req[12]	fnc[12-1-1]	**Gas test display**	OK
		･Display that buzzer does not sound.	OK
		･Displaying gas species used for calibration.	OK
		･Only the type of gas installed shall be displayed.	OK
		･Displayed as "0" up to -5% of UpperLimit.	OK
		･Minus a true value should be displayed up to -5% to -10% of UpperLimit.	OK
		･If it exceeds -10% of UpperLimit it should be indicated as minus over.	OK
		･When a gas alarm is issued, the gas concentration should flash.	OK
		･If a gas alarm is being issued, display the type of alarm being issued.	OK
		･LED is activated when gas alarm is issued.	OK
		･When a gas alarm is issued, the vibration motor is activated.	OK
		･The buzzer shall not operate when a gas alarm is issued.	OK
		･Press the AIR key to reset the alarm if a gas alarm is sounding.	OK
		･Press the MODE key to exit the gas test item.	OK
		･Press AIR+MODE key to exit the gas test item.	OK
	fnc[12-2-1]	**Sensor replacement date and time display**	OK
		･Display the date of replacement of the installed sensor, pump and battery.	OK
		･Press the AIR key to change the display items.	OK
		･Press the AIR+MODE key briefly to reverse the order of the AIR display items.	OK
		･Press and hold the AIR+MODE key to exit the sensor replacement date/time display.	OK
		･Press the MODE key while ESCAPE is selected to exit the sensor replacement date display.	OK
		･If the MODE key is pressed while the sensor, pump or battery is selected, a transition to the sensor replacement date/time setting item of that item shall be possible.	OK
	fnc[12-2-2]	**Sensor replacement date and time setting**	OK
		･Press the AIR key to return to the sensor replacement date display without changing the replacement date.	OK
		･Press the MODE key to update the replacement date and time with the current date and time and return to the sensor replacement date and time display.	OK

Request number	Function number	Check Item	Judgment
req[13]	fnc[13-1-1]	**IO setting**	OK
		・IO settings of the main microcomputer shall be set according to the IO map.	OK
		・IO settings of the sensor microcomputer shall be set according to the IO map.	OK
	fnc[13-2-1]	**ROMSUM acquisition**	OK
		Main microcomputer	OK
		・ROMSUM value of the main microcomputer shall be correctly calculated.	OK
		・Calculating all addresses 0xFFF80000 to 0xFFFFFFFF.	OK
		・Do not stop screen update during ROMSUM calculation.	OK
		・Checking once every 24 hours.	OK
		Sensor microcomputer	OK
		・ROMSUM value of the sensor microcomputer shall be correctly calculated.	OK
		・Calculating all addresses 0x0000 to 0x7FFF.	OK
		・Do not stop communication processing with the main microcomputer during ROMSUM calculation.	OK
		・Checking once every 24 hours	OK
	fnc[13-3-1]	**RAM initialization**	OK
		・Set the specified initial value to the RAM that needs the initial value used for each function when the main microcomputer is started.	OK
		・Set the specified initial value to the RAM that needs the initial value used for each function when the sensor microcomputer is started.	OK
	fnc[13-3-2]	**RAM check**	OK
		Main microcomputer	OK
		・Write 0x55 and 0xAA to all target RAM, and then perform read comparison.	OK
		・If the target RAM is normal, no abnormality will occur.	OK
		・If the target RAM is abnormal, an abnormality will occur.	OK
		・0xE900 to 0xE907, 0x0004 to 0x6000, and 0xEB00 to 0xFFFF are the target RAMs.	OK
		Sensor microcomputer	OK
		・Write 0x55 and 0xAA to all target RAM, and then perform read comparison.	OK
		・If the target RAM is normal, no error will occur.	OK
		・If the target RAM is abnormal, an error will occur.	OK
		・0x000FE700-0x000FE705 and 0x000FE780-0x000FFE00 are the target RAMs	OK
	fnc[13-4-1]	**Interrupt function**	OK
		Main microcomputer	OK
		・Handling CMT0 Interrupts at 10msec Intervals when an CMT0 Interrupt is active.	OK
		Sensor microcomputer	OK
		・Interrupting IT at 10msec intervals when IT interrupts are active.	OK
	fnc[13-4-2]	**Task processing**	OK
		Main microcomputer	OK
		・100msec task processing for each 100msec.	OK
		・TaskA task processing for each 250msec.	OK
		・TaskB task processing after Event processing for each 250msec.	OK
		・EventA task processing for each 1000msec.	OK
		・EventB task processing for each 1000msec.	OK
		・EventC task processing for each 1000msec.	OK
		・EventD task processing for each 1000msec.	OK
		・EventA to D processing start interval is 250msec.	OK
		Sensor microcomputer	OK
		・250m task processing for each 250msec.	OK
	fnc[13-5-1]	**PWM function**	OK
		Main microcomputer	OK
		・PWM operation at the specified number.	OK
		・If PWM is off, the output port should be off.	OK
	fnc[13-6-1]	**A/D setting**	OK
		・The setting of each A/D must be correct.	OK
		Main microcomputer	OK
		・AN000：Lithium ion battery voltage (BAT) (12 bit minus none：0mV～2800mV)	OK
		・AN001：Pressure sensor voltage (PS) (12bit minus none：0mV～2800mV)	OK
		・AN002：O2(AMP_HI) sensor voltage (OXH) (12bit minus none：0mV～2800mV)	OK
		・AN003：O2(AMP_LO) sensor voltage (OXL) (12bit minus none：0mV～2800mV)	OK

	・AN004：Power supply voltage (SV) (12bit minus none：0mV～2800mV)	OK
	・AN005：Power supply voltage (MV) (12bit minus none：0mV～2800mV)	OK
	・AN006：Reference Voltage (ECV1) (12bit minus none：0mV～2800mV)	OK
	・AN007：Reference Voltage (ECV2) (12bit minus none：0mV～2800mV)	OK
	・AN024：Reference voltage (ECV3) (12bit minus none：0mV～2800mV)	OK
	・AN025：Combustible element voltage (HCV) (12bit minus none：0mV～2800mV)	OK
	・AN026：PS_DAC output voltage (PZF) (12bit minus none：0mV～2800mV)	OK
	Sensor microcomputer	OK
	・PGA0P-PGA0N: Combustible sensor output (PGA is automatically variable from 1 to 16) (24 bit minus possessed: -800mV to 800mV)	OK
	・PGA1P-PGA1N: H2S sensor output (PGA is automatically variable from 1 to 16) (24 bit minus possessed: -800mV to 800mV)	OK
	・PGA2P-PGA2N: CO sensor output (PGA is automatically variable from 1 to 16) (24 bit minus possessed: -800mV to 800mV)	OK
	・PGA3P-PGA3N: Temperature sensor output (PGA is fixed at 2) (24 bit minus possessed: -400mV to 400mV)	OK
fnc[13-6-2]	**A/D reading**	OK
	・The input of each A/D is the same as the A/D value in the microcomputer.	OK
	Main microcomputer	OK
	・AN000: Lithium ion battery voltage (BAT) (acquired for each 10msec)	OK
	・AN001：Pressure sensor voltage (PS) (acquired for each 10msec)	OK
	・AN002：O2(AMP_HI) sensor voltage (OXH) (acquired for each 10msec)	OK
	・AN003：O2(AMP_LO) sensor voltage (OXL) (acquired for each 10msec)	OK
	・AN004：Power supply voltage (SV) (acquired for each 10msec)	OK
	・AN005：Power supply voltage (MV) (acquired for each 10msec)	OK
	・AN006：Reference Voltage (ECV1) (acquired for each 10msec)	OK
	・AN007：Reference Voltage (ECV2) (acquired for each 10msec)	OK
	・AN024：Reference voltage (ECV3) (acquired for each 10msec)	OK
	・AN025：Combustible element voltage (HCV) (acquired for each 10msec)	OK
	・AN026：PS_DAC output voltage (PZF) (acquired for each 10msec)	OK
	Sensor microcomputer	OK
	・PGA0P-PGA0N: Combustible sensor output (acquired for each 10msec)	OK
	・PGA1P-PGA1N: H2S sensor output (acquired for each 10msec)	OK
	・PGA2P-PGA2N: CO sensor output (acquired for each 10msec)	OK
	・PGA3P-PGA3N: Temperature sensor output (acquired for each 10msec)	OK
fnc[13-7-1]	**UART setting**	OK
	・UART settings are correct.	OK
	Main microcomputer	OK
	・SCI5: USB communication line (115200bps)	OK
	・SCI9: Communication line with sensor microcomputer (38400bps)	OK
	Sensor microcomputer	OK
	・SAU: Communication line with main microcomputer (38400bps)	OK
fnc[13-7-2]	**UART transmission**	OK
	・UART transmission is correct.	OK
	Main microcomputer	OK
	・SCI5：USB communication line	OK
	・SCI9: Communication line with sensor microcomputer	OK
	Sensor microcomputer	OK
	・SAU: Communication line with main microcomputer	OK
fnc[13-7-3]	**UART reception**	OK
	・UART reception is correct.	OK
	Main microcomputer	OK
	・SCI5：USB communication line	OK
	・SCI9: Communication line with sensor microcomputer	OK
	Sensor microcomputer	OK
	・SAU: Communication line with main microcomputer	OK
fnc[13-8-1]	**SPI setting**	OK
	・Configuration of each SPI is correct.	OK
	・Change the connection partner.	OK
	Main microcomputer	OK
	・RSPI0: Communication Line with FRAM (3686.4kbps)	OK

		・RSPI0: Communication Line with FLASH (3686.4kbps)	OK
	fnc[13-8-2]	**SPI transmission**	OK
		・Transmission of each SPI is correct.	OK
		Main microcomputer	OK
		・RSPI0: Communication line with FRAM	OK
		・RSPI0: Communication line with FLASH	OK
	fnc[13-8-3]	**SPI reception**	OK
		・Each SPI must be received correctly.	OK
		Main microcomputer	OK
		・RSPI0: Communication line with FRAM	OK
		・RSPI0: Communication line with FLASH	OK
	fnc[13-9-1]	**I2C setting**	OK
		・Each I2C setting must be correct.	OK
		・Change the connection partner.	OK
		Main microcomputer	OK
		・SCI6: Communication line with LCD (400kbps)	OK
		・SCI6: Communication line with RTC (400kbps)	OK
	fnc[13-9-2]	**I2C transmission**	OK
		・Transmission of each I2C shall be correct	OK
		Main microcomputer	OK
		・SCI6: Communication line with LCD	OK
		・SCI6: Communication line with RTC	OK
	fnc[13-9-3]	**I2C reception**	OK
		・The reception of each I2C is correct.	OK
		Main microcomputer	OK
		・SCI6: Communication line with LCD	OK
		・SCI6: Communication line with RTC	OK
	fnc[13-10-1]	**WDT setting**	OK
		・Clock division ratio: PCLK/2048 = 7.2kHz	OK
		・Timeout cycle: 16384 cycles	OK
		・Timeout period ：2275.556 msec	OK
		・Reset interrupt: Reset output	OK
	fnc[13-10-2]	**WDT cycle reset**	OK
		・Working to reset WDT in TaskA 250msec task processing.	OK
		・If necessary, reset the WDT with a heavy function.	OK
	fnc[13-11-1]	**Data processing**	OK
		・Proper RAM numeric processing of each function.	OK
	fnc[13-12-1]	**Setting processing**	OK
		・Configuring the hardware correctly.	OK
	fnc[13-13-1]	**MCU power supply voltage monitoring**	OK
		Main microcomputer	OK
		・ Use the LVD function of the MCU to monitor the power supply voltage.	OK
		・If there is no problem with 2.8V of the MCU, there should be no abnormality under the atmosphere of the upper and lower temperature range of the operating temperature range.	OK
		・ If the MCU's 2.8V is 2.3V or less, an error will occur.	OK
		Sensor microcomputer	OK
		・ Use the LVD function of the MCU to monitor the power supply voltage.	OK
		・If there is no problem with 2.8V of the MCU, there should be no abnormality under the atmosphere of the upper and lower temperature range of the operating temperature range.	OK
		・If the MCU's 2.8V is 2.4V or less, an error will occur.	OK
	fnc[13-14-1]	**DAC function**	OK
		Main microcomputer	OK
		・DAC operation at the specified number.	OK
		・If DAC is off, the output port should be off.	OK

Request number	Function number	Check Item	Judgment
req[14]	fnc[14-1-1]	**FRAM reading**	OK
		･Read the settings correctly from the FRAM at power-up.	OK
		･Check the area with two-sided check to check the reliability of the data.	OK
		･Read processing considering two-sided check+SUM check processing on the front side and the opposite side×2 sides.	OK
		･The factory default setting value area shall be read from the front side and the opposite side×2 sides in consideration of two-sided check+SUM check processing.	OK
		･The alarm point area for reset must be read from the front side and the opposite side×2 sides in consideration of the two-sided check+SUM check process.	OK
		･The lunchbreak value area shall be read with two-sided check+SUM check processing on the front side and the opposite side×2 sides.	OK
		･Read the user ID area only on one front side.	OK
		･Read the station ID area only on one front side.	OK
	fnc[14-1-2]	**FRAM write**	OK
		･To write setting values correctly in each FRAM area.	OK
		･Write→Read→Verify processing within write processing.	OK
		･Write two-sided check+SUM check processing on the front side and the opposite side×2 sides.	OK
		･The factory default setting area is to write two-sided check+SUM check processing on the front side and the opposite side×2 sides.	OK
		･The alarm point set value area for reset is written with two-sided check+SUM check processing on the front side and the opposite side×2 sides.	OK
		･Lunchbreak Value Area Writes Double-Side Check+SUM Check Processing on Front and Reverse x 2 Faces.	OK
		･Write the user ID area only on one front side.	OK
		･Write the station ID area only on one front side.	OK
		･The use address of each area is correct.	OK
		Used address	OK
		･Device setting range: 0x0100 to 0x0AFF, 0x0B00 to 0x14FF, 0x4100 to 0x4AFF, 0x4B00 to 0x54FF	OK
		･Factory default range: 0x1500 to 0x1EFF, 0x1F00 to 0x28FF, 0x5500 to 0x5EFF, 0x5F00 to 0x68FF	OK
		･Reset alarm point area: 0x3400-0x34FF, 0x3500-0x35FF, 0x7400-0x74FF, 0x7500-0x75FF	OK
		･Lunchbreak value range: 0x3600-0x36FF, 0x3700-0x37FF, 0x7600-0x76FF, 0x7700-0x77FF	OK
		･User ID area: 0x3800 to 0x3FFF	OK
		･Station ID area: 0x7800 to 0x7FFF	OK
	fnc[14-1-3]	**FRAMSUM acquisition**	OK
		･Proper SUM calculation for each area.	OK
		･Sum calculation for each write operation.	OK
		Use area	OK
		･Equipment setting value area	OK
		･Factory set value area	OK
		･Alarm point area for resetting	OK
		･lunchbreak value range	OK
	fnc[14-2-1]	**Read FLASH**	OK
		･Read correctly from each area.	OK
		Use area	OK
		･Power events: 0x000000 to 0x00FFFF	OK
		･Alarm trend: 0x010000 to 0x02DFFF	OK
		･Snap log: 0x02E000 to 0x03DFFF, 0x0A0000 to 0x0A0FFF	OK
		･Interval trend: 0x03E000 to 0x04FFFF	OK
		･Alarm Event: 0x050000 to 0x05FFFF	OK
		･Failure Event: 0x060000 to 0x06FFFF	OK
		･Calibration history: 0x070000 to 0x07FFFF, 0x090000 to 0x09FFFF	OK
		･Configuration change history: 0x080000 to 0x08FFFF	OK
	fnc[14-2-2]	**Write FLASH**	OK
		･Writing correctly from each area.	OK
		･Erasing before writing.	OK
		Use area	OK
		･Power events: 0x000000 to 0x00FFFF	OK
		･Alarm trend: 0x010000 to 0x02DFFF	OK
		･Snap log: 0x02E000 to 0x03DFFF, 0x0A0000 to 0x0A0FFF	OK

	･Interval trend: 0x03E000 to 0x04FFFF	OK
	･Alarm Event: 0x050000 to 0x05FFFF	OK
	･Failure Event: 0x060000 to 0x06FFFF	OK
	･Calibration history: 0x070000 to 0x07FFFF, 0x090000 to 0x09FFFF	OK
	･Configuration change history: 0x080000 to 0x08FFFF	OK
fnc[14-3-1]	**RTC setting**	OK
	･Setting the charging function of RTC at power-up.	OK
	･Acquire and set the clock error flag at power-up.	OK
fnc[14-3-2]	**RTC date and time input**	OK
	･Write to RTC when setting date and time.	OK
	･Perform the "WRITE→READ" process within the write process and confirm that the value is the same from year to minute.	OK
fnc[14-3-3]	**RTC date and time output**	OK
	･ Read every time within 1000msec task processing of TaskB.	OK
	･Implement "Read → Read" within the read process and check if the two data are within 60 seconds.	OK

fnc[14-4-1]	**USB setting**	OK
	･USB settings: communication settings must be done correctly	OK
fnc[14-4-2]	**USB data transmission**	OK
	･Transmission buffer data can be transmitted correctly.	OK
	･Call the transmission interrupt process when a transmission interrupt occurs.	OK
fnc[14-4-3]	**USB data reception**	OK
	･Transmission buffer data can be transmitted correctly.	OK
	･Call the transmission interrupt process when a transmission interrupt occurs.	OK
	･Reading communication frames from received data.	OK
fnc[14-5-1]	**LCD setting**	OK
	･Can initialize the RAM area used to create the display.	OK
	･Enabling the LCD driver to write configuration information.	OK

fnc[14-5-2]	**LCD display data creation**	OK
	･To be able to display the battery icon.	OK
	･Be able to display bump check icon.	OK
	･Be able to display a heart icon.	OK
	･Be able to display long energy icon.	OK
	･Be able to display pump icon.	OK
	･To be able to display time icon.	OK
	･It is possible to display the gas name icon of each sensor.	OK
	･It is possible to display the unit icon of each sensor.	OK
	･When flashing of the icon is set, the set icon portion blinks.	OK
	･All lighting display is possible.	OK
	･It is possible to display all lights off.	OK
	･It is possible to display the concentration of each sensor.	OK
	･To be able to display characters in the density part.	OK
	･It is possible to display the dot portion of each density.	OK
	･The specified comment can be displayed on the displayed part.	OK
	･When blinking of density is set, the set density portion blinks.	OK
	･When dot blinking is set, the set dot portion blinks.	OK
	･When blinking of comment is set, the set comment part blinks.	OK
fnc[14-5-3]	**LCD display data transmission**	OK
	･Sending display data to the LCD driver for each 250msec.	OK
	･The sent display data is the same as the data displayed on the LCD.	OK
	･Do not stop other tasks in the sending process.	OK
fnc[14-6-1]	**LED control**	OK
	･Alarm LED can be lit.	OK
	･Alarm LED can be turned off.	OK
	･When the LED operates, the LED is turned on or off at a predetermined cycle.	OK
	･The backlight can be turned off.	OK
	･Accurate time count for backlight processing.	OK
fnc[14-7-1]	**Light control**	OK
	･The light can be turned on.	OK
	･The light can be turned off.	OK
	･The light shall automatically turn off after a specified time from when they start to turn on.	OK
fnc[14-8-1]	**Buzzer basic settings**	OK
	･Buzzer operating variables are correctly initialized.	OK
	･The buzzer does not operate when the device is powered off.	OK
fnc[14-8-2]	**Buzzer frequency adjustment**	OK
	･Buzzer operation at the predetermined frequency.	OK
	･The buzzer port is OFF when the buzzer is not operating.	OK
	･Change the PWM frequency at the end of one cycle.	OK
fnc[14-8-3]	**Buzzer sound output adjustment**	OK
	･Buzzer operation at a predetermined cycle.	OK
	･Changing the buzzer sound output based on the data in the alarm table.	OK
	･The data in the alarm table matches the timbre of the buzzer.	OK
fnc[14-8-4]	**Buzzer duty adjustment**	OK
	･The output to the buzzer is 50% ON during one cycle.	OK
fnc[14-8-5]	**Special state buzzer operation**	OK
	･When the measurement mode and display mode, the left and right LEDs blink every 4 seconds. (1 second ON, 3 seconds OFF)	OK
	･When the AIR is being adjusted, The left and right LEDs blink every 4 seconds. (1 second ON, 3 seconds OFF)	OK
	･When the AIR adjustment is not performed in measurement mode and display mode, not blink the mode transition LED.	OK
	･When the low battery condition, the left and right LEDs blink every 4 seconds. (1 second ON, 3 seconds OFF)	OK
	･When the low battery condition, the buzzer issues a single note every 4 seconds. (1 second alarm, 3 second stop).	OK
	･When the battery is not low, do not perform the action to notify the low battery.	OK
fnc[14-9-1]	**Vibration motor operation control**	OK
	･Turn on the vibration motor when the operation setting is turned on.	OK
	･Turn off the vibration motor when the operation setting is turned off.	OK

	･Changing the operation of the vibration motor based on the data in the alarm table.	OK
	･The data in the alarm table and the operation cycle of the vibration motor are matched.	OK
fnc[14-10-1]	**Key monitoring**	OK
	･Key operation and the input status of the port corresponding to the key are the same.	OK
	･Checking the operation status of keys for each 10msec.	OK
fnc[14-10-2]	**Key event**	OK
	･Compare key operation status with key event table data to determine key event.	OK
	･Key operation status and key event match.	OK
	･Calculate the time when the key is not pressed.	OK
	･Key operation status coincides with the time when the key is not pressed.	OK
	･Counting down the set time (waiting time) correctly.	OK
	･Outputting a timeout event when standby time becomes zero.	OK

	fnc[14-11-1]	**Thermistor temperature acquisition**	OK
		・Temperature can be calculated from thermistor sensor output ((sensor output−207.5mV)/0.756mV)=temperature	OK
		・The temperature can be calculated from −50℃ to +70℃ (±10℃ of the specified temperature range of the equipment).	OK
		・Temperatures below-50℃ shall be fixed at-50℃.	OK
		・Temperatures above +70℃ shall be fixed at +70℃.	OK
		・Calculating the temperature once a second.	OK
	fnc[14-12-1]	**Pump control**	OK
		・Variables for pump control are initialized correctly.	OK
		・The pump must be turned ON when a request is made to drive the pump.	OK
		・The pump must be turned OFF when a request is made to stop the pump.	OK
		・The pump operates at the specified voltage.	OK
		・When starting at low temperature, raise the pump drive voltage and perform retry processing.	OK
	fnc[14-13-1]	**Pressure acquisition**	OK
		・The variable for obtaining the pressure sensor output must be initialized correctly.	OK
		・Operating the pressure sensor at the specified voltage.	OK
		・The pressure sensor output can be obtained correctly.	OK
		・Obtain the pressure sensor output when the pump is OFF.	OK
		・Obtain the voltage for checking the connection of the pump from the pressure sensor output when the pump is started and the pressure sensor output when the pump is turned off.	OK
		・Obtain the voltage for confirming the decrease in flow rate from the pressure sensor output while the pump is running and the pressure sensor output when the pump is off.	OK
	fnc[14-14-1]	**Hall IC power supply ON**	OK
		・Transition to SDM mode when power is turned on in Hall IC.	OK
		・Ignore Hall IC input if Hall IC input is present when power is ON.	OK
	fnc[14-15-1]	**Combustible gas sensor output acquisition**	OK
		・When the device is energized for 1 second, output for 0.1 seconds, 0.5 seconds and 1.0 seconds after energization is obtained.	OK
		・If there is an abnormality in the combustible gas sensor, stop energizing.	OK
	fnc[14-16-1]	**Obtain oxygen/toxic gas sensor output**	OK
		・Sensor output can be obtained for each 250msec.	OK
		・CO-H2 shall average the AD values acquired for each 250msec for 16 seconds per second.	OK
	fnc[14-17-1]	**Lithium rechargeable battery voltage acquisition**	OK
		・ Acquire battery voltage of lithium rechargeable battery.	OK