OVAL INSTRUCTIONS

Ins. No. L-740HC-1-E

HART-compliant ALTImass series

Communication Manual

Thank you for selecting the OVAL ALTImass series Coriolis Flowmeter.
Every OVAL product is manufactured and shipped under stringent quality control.
Please read through this manual to become familiar with this product before you place it in service.

PREFACE

This manual is prepared commonly for various models of ALTImass series. Check your model and verify the contents of operations as well as input and output described in this manual. You are requested to reference only the relevant items.
With ALTImass series, various kinds of settings are available easily by front-panel key operations or communication. However, please read through this manual when you change settings by communication.
If any inquiry is required, contact your nearest OVAL sales office or service center. (When you inquire, please specify the product name, model / Type No., and other pertinent information.)

This communication manual supports the following models:

- ALTImass Type U/High Performance: CAxxx series
  (FOUNDATION fieldbus Communication Specification)
- ALTImass Type S/Single Straight-Tube: CSxxx series
  (FOUNDATION fieldbus Communication Specification)
- ALTImass Type B/Inexpensive, General-purpose: CBxxx series
  (FOUNDATION fieldbus Communication Specification)

※ : For basic handling and key operation, refer to the ALTImass Instruction Manual L-740-*.

*: Revision number of the instruction manual

CONTENTS

1. Outline of Communication Functions

HART (Highway Addressable Remote Transducer)-compliant ALTImass is a product certified and registered by FieldComm Group, Inc., and can communicate with higher-level equipment (DCS, engineering tools, etc.) that supports the HART specifications.

For the host device to communicate with this device, download DD (Device Description) from the URL below and setup the host device in advance.

https://www.fieldcommgroup.org/registered-products/ab97070e-1fb2-e811-8153-e0071b66aea1

For information on HART communication technology and general specifications, please visit the FieldComm Group website below.

https://www.fieldcommgroup.org/

2. Communication Specifications

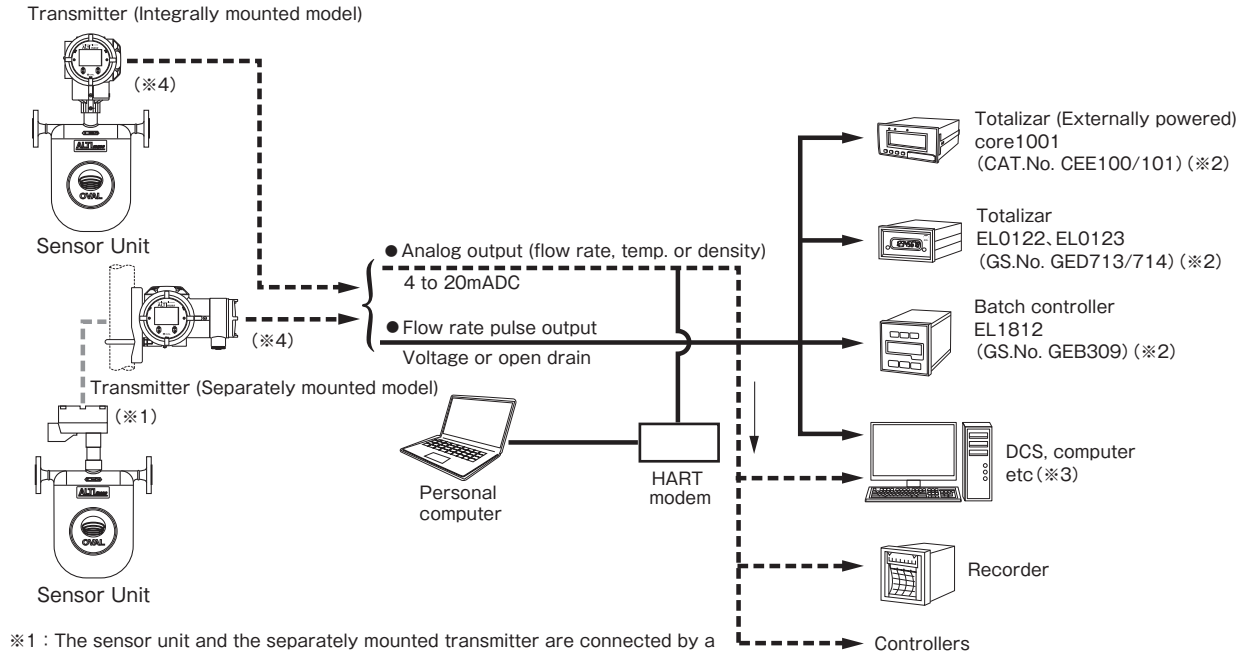
Protocol	HART Rev. 7.2
Manufacturer ID (hex)	000064
Device Type ID (hex)	6482
Category	Flow
Profile	HART Field Device
DEV_REV (hex)	0x01
DD Revision	0x02
Dynamic Variables	PV, SV, TV, QV
Device Variables	Selectable from mass flow, volume flow, density or temperature. (However, TV and QV can be selected from either mass flow or volume flow.)

3. Wiring

3.1 Wiring Configuration

Connections between this product, host device (DCS, engineering tools, etc.), and other field devices are configured as shown below.

For other details, refer to the ALTImass Instruction Manual L-740-*.



※1 : The sensor unit and the separately mounted transmitter are connected by a dedicated cable.
※2 : For details of combined instruments, please refer to individual catalogs and general specifications.
※3 : Communication is possible only with HART protocol version 7
※4 : Of the two analog output systems for HART communication, only analog output 1 is supported.

Fig.3.1

3.2 Wiring Procedure

3.2.1 Cable Gland

The cable pull-in fittings and applicable cable size vary depending on the applicable explosionproof standard. For details, refer to “10.6 Notes on Explosionproof Specifications” in the ALTImass Instruction Manual L-740-*.

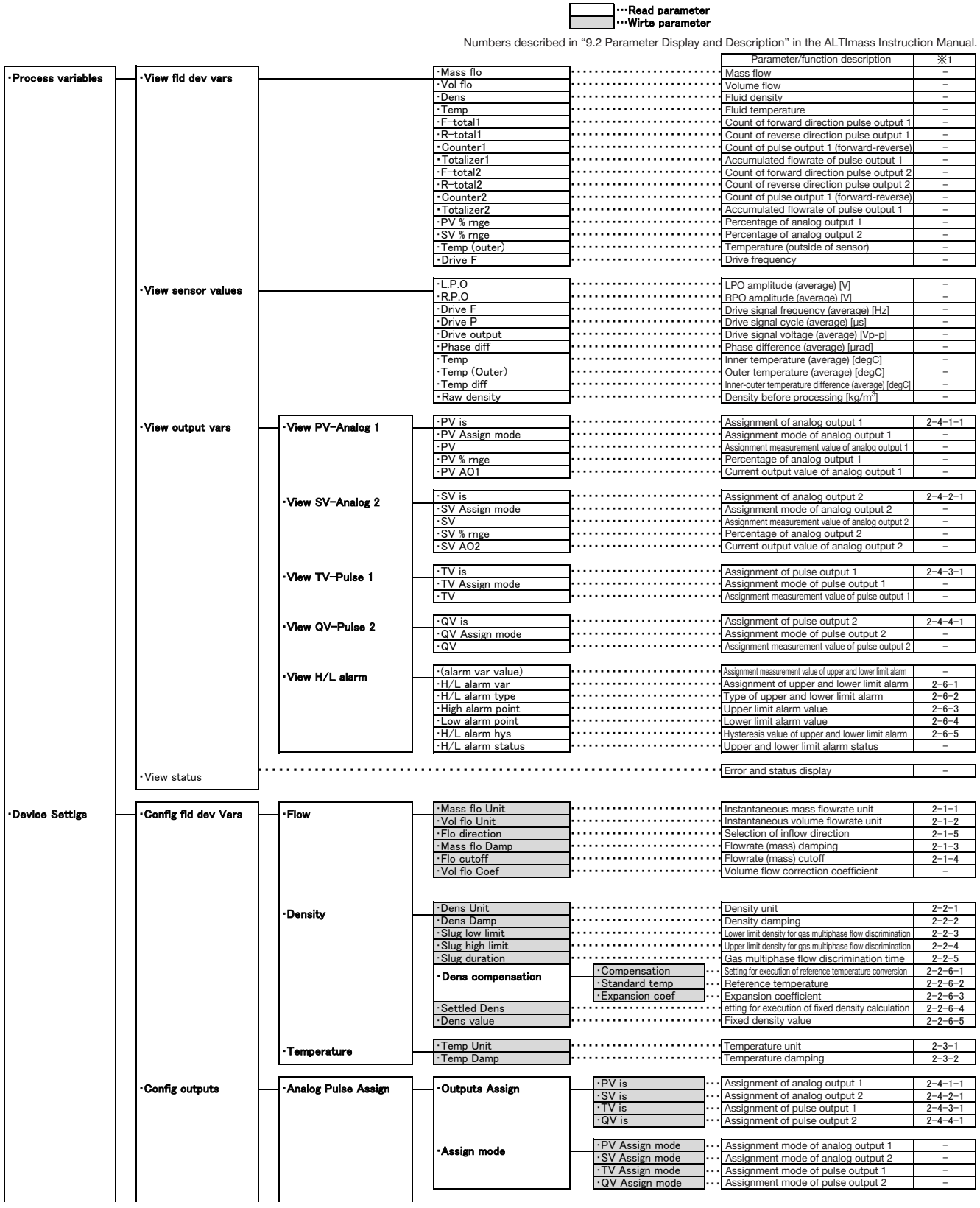
3.2.2 Power and Communication Signal Cable Connections (Common to Integral and Separate Types)

Terminals for wiring connections are found at the back of transmitter housing. Remove the terminal cover and make wiring connections.

For details, refer to “7.1.1 Power Supply and Output Signal Connections (for both integrated and separated types)” in the ALTImass Instruction Manual L-740-*.

4. DD's Menu Structure and Parameters

For details of parameters and functions, refer to the ALTImass Instruction Manual L-740-* with reference to the following.



				Parameter/function description	※1
·Process variables	·View fld dev vars		·Mass flo	Mass flow	–
			·Vol flo	Volume flow	–
			·Dens	Fluid density	–
			·Temp	Fluid temperature	–
			·F–total1	Count of forward direction pulse output 1	–
			·R–total1	Count of reverse direction pulse output 1	–
			·Counter1	Count of pulse output 1 (forward-reverse)	–
			·Totalizer1	Accumulated flowrate of pulse output 1	–
			·F–total2	Count of forward direction pulse output 2	–
			·R–total2	Count of reverse direction pulse output 2	–
			·Counter2	Count of pulse output 1 (forward-reverse)	–
			·Totalizer2	Accumulated flowrate of pulse output 1	–
			·PV % rnge	Percentage of analog output 1	–
			·SV % rnge	Percentage of analog output 2	–
			·Temp (outer)	Temperature (outside of sensor)	–
			·Drive F	Drive frequency	–
	·View sensor values		·L.P.O	LPO amplitude (average) [V]	–
			·R.P.O	RPO amplitude (average) [V]	–
			·Drive F	Drive signal frequency (average) [Hz]	–
			·Drive P	Drive signal cycle (average) [μs]	–
			·Drive output	Drive signal voltage (average) [Vp-p]	–
			·Phase diff	Phase difference (average) [μrad]	–
			·Temp	Inner temperature (average) [degC]	–
			·Temp (Outer)	Outer temperature (average) [degC]	–
			·Temp diff	Inner-outer temperature difference (average) [degC]	–
			·Raw density	Density before processing [kg/m^3]	–
	·View output vars	·View PV–Analog 1	·PV is	Assignment of analog output 1	2–4–1–1
			·PV Assign mode	Assignment mode of analog output 1	–
			·PV	Assignment measurement value of analog output 1	–
			·PV % rnge	Percentage of analog output 1	–
			·PV AO1	Current output value of analog output 1	–
		·View SV–Analog 2	·SV is	Assignment of analog output 2	2–4–2–1
			·SV Assign mode	Assignment mode of analog output 2	–
			·SV	Assignment measurement value of analog output 2	–
			·SV % rnge	Percentage of analog output 2	–
			·SV AO2	Current output value of analog output 2	–
		·View TV–Pulse 1	·TV is	Assignment of pulse output 1	2–4–3–1
			·TV Assign mode	Assignment mode of pulse output 1	–
			·TV	Assignment measurement value of pulse output 1	–
		·View QV–Pulse 2	·QV is	Assignment of pulse output 2	2–4–4–1
			·QV Assign mode	Assignment mode of pulse output 2	–
			·QV	Assignment measurement value of pulse output 2	–
		·View H/L alarm	·(alarm var value)	Assignment measurement value of upper and lower limit alarm	–
			·H/L alarm var	Assignment of upper and lower limit alarm	2–6–1
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			·Low alarm point	Lower limit alarm value	2–6–4
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			·H/L alarm status	Upper and lower limit alarm status	–
	·View status			Error and status display	–
·Device Settigs	·Config fld dev Vars	·Flow	·Mass flo Unit	Instantaneous mass flowrate unit	2–1–1
			·Vol flo Unit	Instantaneous volume flowrate unit	2–1–2
			·Flo direction	Selection of inflow direction	2–1–5
			·Mass flo Damp	Flowrate (mass) damping	2–1–3
			·Flo cutoff	Flowrate (mass) cutoff	2–1–4
			·Vol flo Coef	Volume flow correction coefficient	–
		·Density	·Dens Unit	Density unit	2–2–1
			·Dens Damp	Density damping	2–2–2
			·Slug low limit	Lower limit density for gas multiphase flow discrimination	2–2–3
			·Slug high limit	Upper limit density for gas multiphase flow discrimination	2–2–4
			·Slug duration	Gas multiphase flow discrimination time	2–2–5
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				·Expansion coef: Expansion coefficient	2–2–6–3
			·Settled Dens	etting for execution of fixed density calculation	2–2–6–4
			·Dens value	Fixed density value	2–2–6–5
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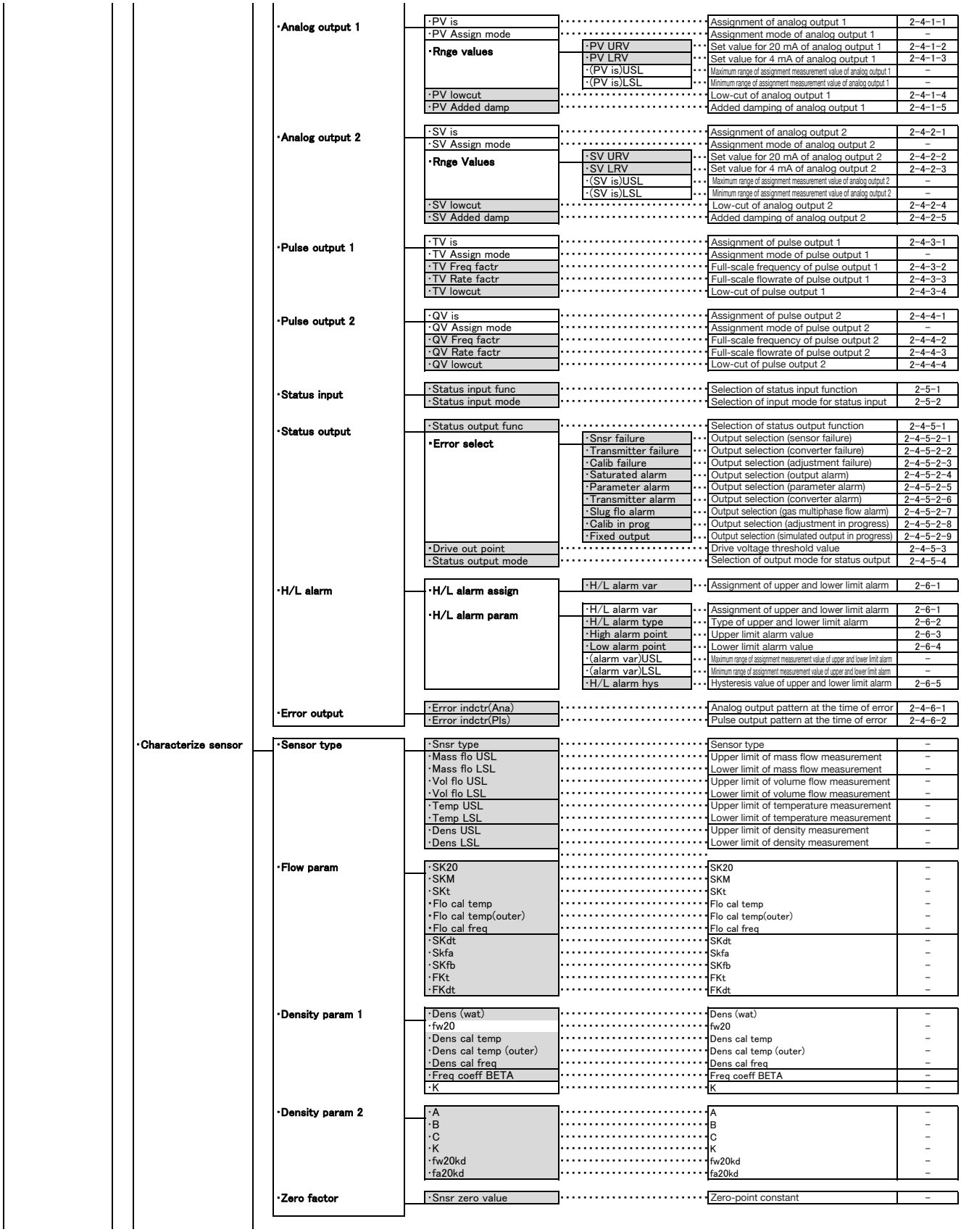
			·Temp Damp	Temperature damping	2–3–2
	·Config outputs	·Analog Pulse Assign	·Outputs Assign	·PV is: Assignment of analog output 1	2–4–1–1
				·SV is: Assignment of analog output 2	2–4–2–1
				·TV is: Assignment of pulse output 1	2–4–3–1
				·QV is: Assignment of pulse output 2	2–4–4–1
			·Assign mode	·PV Assign mode: Assignment mode of analog output 1	–
				·SV Assign mode: Assignment mode of analog output 2	–
				·TV Assign mode: Assignment mode of pulse output 1	–
				·QV Assign mode: Assignment mode of pulse output 2	–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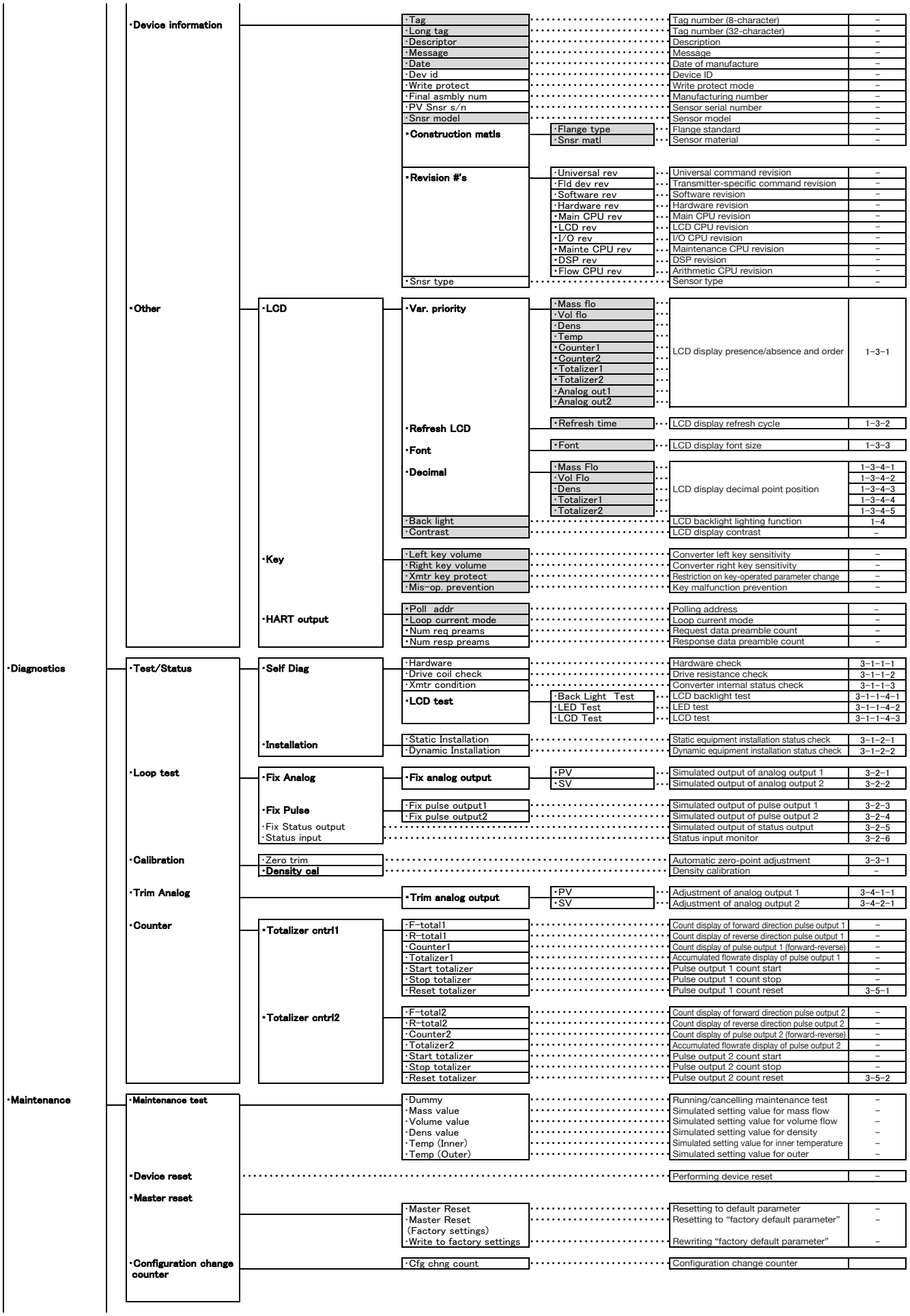
・Mass flo USL — Upper limit of mass flow measurement — –
・Mass flo LSL — Lower limit of mass flow measurement — –
・Vol flo USL — Upper limit of volume flow measurement — –
・Vol flo LSL — Lower limit of volume flow measurement — –
・Temp USL — Upper limit of temperature measurement — –
・Temp LSL — Lower limit of temperature measurement — –
・Dens USL — Upper limit of density measurement — –
・Dens LSL — Lower limit of density measurement — –
・Flow param
・SK20 — SK20 — –
・SKM — SKM — –
・SKt — SKt — –
・Flo cal temp — Flo cal temp — –
・Flo cal temp(outer) — Flo cal temp(outer) — –
・Flo cal freq — Flo cal freq — –
・SKdt — SKdt — –
・Skfa — Skfa — –
・SKfb — SKfb — –
・FKt — FKt — –
・FKdt — FKdt — –
・Density param 1
・Dens (wat) — Dens (wat) — –
・fw20 — fw20 — –
・Dens cal temp — Dens cal temp — –
・Dens cal temp (outer) — Dens cal temp (outer) — –
・Dens cal freq — Dens cal freq — –
・Freq coeff BETA — Freq coeff BETA — –
・K — K — –
・Density param 2
・A — A — –
・B — B — –
・C — C — –
・K — K — –
・fw20kd — fw20kd — –
・fa20kd — fa20kd — –
・Zero factor
・Snsr zero value — Zero-point constant — –


・Diagnostics
・Maintenance
・Device information
・Tag
・Long tag
・Descriptor
・Message
・Date
・Dev id
・Write protect
・Final asmbly num
・PV Snsr s/n
・Snsr model
・Construction matls
・Flange type
・Snsr matl
・Revision #'s
・Universal rev
・Fld dev rev
・Software rev
・Hardware rev
・Main CPU rev
・LCD rev
・I/O rev
・Mainte CPU rev
・DSP rev
・Flow CPU rev
・Snsr type
・Other
・LCD
・Var. priority
・Mass flo
・Vol flo
・Dens
・Temp
・Counter1
・Counter2
・Totalizer1
・Totalizer2
・Analog out1
・Analog out2
・Refresh LCD
・Refresh time
・Font
・Font
・Decimal
・Mass Flo
・Vol Flo
・Dens
・Totalizer1
・Totalizer2
・Back light
・Contrast
・Key
・Left key volume
・Right key volume
・Xmtr key protect
・Mis-op. prevention
・HART output
・Poll addr
・Loop current mode
・Num req preams
・Num resp preams
・Test/Status
・Self Diag
・Hardware
・Drive coil check
・Xmtr condition
・LCD test
・Back Light Test
・LED Test
・LCD Test
・Installation
・Static Installation
・Dynamic Installation
・Loop test
・Fix Analog
・Fix analog output
・PV
・SV
・Fix Pulse
・Fix pulse output1
・Fix pulse output2
・Fix Status output
・Status input
・Calibration
・Zero trim
・Density cal
・Trim Analog
・Trim analog output
・PV
・SV
・Counter
・Totalizer cntrl1
・F-total1
・R-total1
・Counter1
・Totalizer1
・Start totalizer
・Stop totalizer
・Reset totalizer
・Totalizer cntrl2
・F-total2
・R-total2
・Counter2
・Totalizer2
・Start totalizer
・Stop totalizer
・Reset totalizer
・Maintenance test
・Dummy
・Mass value
・Volume value
・Dens value
・Temp (Inner)
・Temp (Outer)
・Device reset
・Master reset
・Master Reset
・Master Reset (Factory settings)
・Write to factory settings
・Configuration change counter
・Cfg chng count
Tag number (8-character) –
Tag number (32-character) –
Description –
Message –
Date of manufacture –
Device ID –
Write protect mode –
Manufacturing number –
Sensor serial number –
Sensor model –
Flange standard –
Sensor material –
Universal command revision –
Transmitter-specific command revision –
Software revision –
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Pulse output 2 count stop –
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Simulated setting value for volume flow –
Simulated setting value for density –
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Simulated setting value for outer –
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Resetting to default parameter –
Resetting to "factory default parameter" –
Rewriting "factory default parameter" –
Configuration change counter

・Review	・Device info	・Manufacturer	Manufacturer name	–
		・Model	Model name	–
		・Tag	Tag number (8-character)	–
		・Long tag	Tag number (32-character)	–
		・Descriptor	Description	–
		・Message	Message	–
		・Date	Date of manufacture	–
		・Dev id	Device ID	–
		・Write protect	Write protect mode	–
		・Final asmbly num	Manufacturing number	–
		・PV Snsr s/n	Sensor serial number	–
		・Snsr model	Sensor model	–
		・Flange type	Flange standard	–
		・Snsr matl	Sensor material	–
		・Snsr type	Sensor type	–
		・Universal rev	Universal command revision	–
		・Fld dev rev	Transmitter-specific command revision	–
		・Software rev	Software revision	–
		・Hardware rev	Hardware revision	–
	・Fld dev vars	・Mass flo Unit	Instantaneous mass flowrate unit	–
		・Vol flo Unit	Instantaneous volume flowrate unit	–
		・Flo direction	Selection of inflow direction	–
		・Mass flo Damp	Flowrate (mass) damping	–
		・Flo cutoff	Flowrate (mass) cutoff	–
		・Vol Flo Coef	Volume flow correction coefficient	–
		・Dens Unit	Density unit	–
		・Dens Damp	Density damping	–
		・Slug low limit	Lower limit density for gas multiphase flow discrimination	–
		・Slug high limit	Upper limit density for gas multiphase flow discrimination	–
		・Slug duration	Gas multiphase flow discrimination time	–
		・Compensation	Setting for execution of reference temperature conversion	–
		・Standard temp	Reference temperature	–
		・Expansion coef	Expansion coefficient	–
		・Settled Dens	Setting for execution of fixed density calculation	–
		・Dens value	Fixed density value	–
		・Temp Unit	Temperature unit	–
		・Temp Damp	Temperature damping	–
	・Outputs	・PV is	Assignment of analog output 1	–
		・PV Assign mode	Assignment mode of analog output 1	–
		・PV URV	Set value for 20 mA of analog output 1	–
		・PV LRV	Set value for 4 mA of analog output 1	–
		・PV lowcut	Low-cut of analog output 1	–
		・PV Added damp	Added damping of analog output 1	–
		・SV is	Assignment of analog output 2	–
		・SV Assign mode	Assignment mode of analog output 2	–
		・SV URV	Set value for 20 mA of analog output 2	–
		・SV LRV	Set value for 4 mA of analog output 2	–
		・SV lowcut	Low-cut of analog output 2	–
		・SV Added damp	Added damping of analog output 2	–
		・TV is	Assignment of pulse output 1	–
		・TV Assign mode	Assignment mode of pulse output 1	–
		・TV Freq factr	Full-scale frequency of pulse output 1	–
		・TV Rate factr	Full-scale flowrate of pulse output 1	–
		・TV lowcut	Low-cut of pulse output 1	–
		・QV is	Assignment of pulse output 2	–
		・QV Assign mode	Assignment mode of pulse output 2	–
		・QV Freq factr	Full-scale frequency of pulse output 2	–
		・QV Rate factr	Full-scale flowrate of pulse output 2	–
		・QV lowcut	Low-cut of pulse output 2	–
		・Status input func	Selection of status input function	–
		・Status input mode	Selection of input mode for status input	–
		・Status output func	Selection of status output function	–
		・H/L alarm var	Assignment of upper and lower limit alarm	–
		・H/L alarm type	Type of upper and lower limit alarm	–
		・High alarm point	Upper limit alarm value	–
		・Low alarm point	Lower limit alarm value	–
		・Snsr failure	Output selection (sensor failure)	–
		・Tranmitter failure	Output selection (converter failure)	–
		・Calib failure	Output selection (adjustment failure)	–
		・Saturated alarm	Output selection (output alarm)	–
		・Parameter alarm	Output selection (parameter alarm)	–
		・Transmitter alarm	Output selection (converter alarm)	–
		・Slug flo alarm	Output selection (gas multiphase flow alarm)	–
		・Calib in prog	Output selection (adjustment in progress)	–
		・Fixed output	Output selection (simulated output in progress)	–
		・Drive out point	Drive voltage threshold value	–
		・Status output mode	Selection of output mode for status output	–
		・Error indctr(Ana)	Analog output pattern at the time of error	–
		・Error indctr(Pls)	Pulse output pattern at the time of error	–
		・Poll addr	Polling address	–
		・Loop current mode	Loop current mode	–
		・Num req preams	Request data preamble count	–
		・Num resp preams	Response data preamble count	–
	・Characterize sensor	・Snsr type	Sensor type	–
		・Mass flo USL	Upper limit of mass flow	–
		・Mass flo LSL	Lower limit of mass flow	–
		・Vol flo USL	Upper limit of volume flow	–
		・Vol flo LSL	Lower limit of volume flow	–
		・Dens USL	Upper limit of density	–
		・Dens LSL	Lower limit of density	–
		・Temp USL	Upper limit of temperature	–
		・Temp LSL	Lower limit of temperature	–
		・SK20	SK20	–
		・SKM	SKM	–
		・SKt	SKt	–
		・Flo cal temp	Flo cal temp	–
		・Flo cal temp(outer)	Flo cal temp(outer)	–
		・Flo cal freq	Flo cal freq	–
		・SKdt	SKdt	–
		・Skfa	Skfa	–
		・SKfb	SKfb	–
		・FKt	FKt	–
		・FKdt	FKdt	–
		・Dens(wat)	Dens (wat)	–
		・fw20	fw20	–
		・Dens cal temp	Dens cal temp	–
		・Dens cal temp(outer)	Dens cal temp (outer)	–
		・Dens cal freq	Dens cal freq	–
		・Freq coeff BETA	Freq coeff BETA	–
		・A	A	–
		・B	B	–
		・C	C	–
		・K	K	–
		・fw20kd	fw20kd	–
		・fa20kd	fa20kd	–
		・Snsr zero value	Zero-point constant	–

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All specifications are subject to change without notice for improvement.

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