User's Manual

ROTAMASS 3 Series
Coriolis Mass Flow and Density Meter
Integral Type RCCT3
Remote Type RCCF31 + RCCS3
European MID Custody Transfer Type (/Q01)

IM 01R04B07-00E-E, additional manual to IM 01R04B04-00x-E

vigilantplant.™

YOKOGAWA

Rota Yokogawa GmbH & Co. KG
Rheinstr. 8
D-79664 Wehr
Germany

IM 01R04B07-00E-E

3rd edition, July 2013 (Rü)

Blank Page

Contents

Blank Page

1. About Rotamass MID Custody Transfer Type (/Q01)

This user manual is additional to IM 01R04B04-00x-E for standard Rotamass 3 series.
This manual describes the special conditions for european MID custody transfer type (option /Q01) which deviate from the standard flowmeter.

Chapters 1, 2, 3, 5, 6, 8, 9, 10, and 11 of IM 01R04B04-00x-E are also valid for Custody Transfer Type.

Chapter 2 of this manual replaces chapter 4 of IM 01R04B04-00x-E.

Chapter 3 of this manual replaces chapter 7 of IM 01R04B04-00x-E.

IMPORTANT
For explosion protected instruments and instructions for PED (Pressure Equipment Directive) see IM 01R04B04-00x-E.

Rotamass with custody transfer option for liquids others than water (tested according OIML R 117-1) is suitable for

- measuring liquids, liquids with solid content, multi-phase mixtures
- simultaneous measurement of density, temperature and cumulated mass and volume
- connection to controllers and process control systems

ROTAMASS provides the following I/O-connections and can be configured for a wide variety of different measurement applications (controlling, checking, monitoring, metering, mixing, filling).

- 1 passive double pulse output (90 degrees phase shifted according DIN EN 6551) for custody transfer of total mass or volume
- 1 analog output for density (tested for custody transfer applications)
- 1 passive pulse output / status output
- 1 status input

The firmware is the same as in standard type. The Custody Transfer type contains the same menu tree as standard type. But some parameters can generally not be used or can only not be used with custody transfer application.

NOTE

Parameter which generally can not be used (e.g. because the necessary hardware is not available) are highlighted in grey in the parameter list and in the menu trees.

Parameter which require special settings or where settings are restricted with custody transfer application are marked with a star " *) ".

For using the Rotamass with option /Q01 for custody transfer the flowmeter must be calibrated at a certified calibration site.

IM 01R04B07-00E-E 3rd edition July 01, 2013-00

Initial verification:

- Before calibration all necessary adjustments must be done via menu setting.
- Hardware Write Protect must be set (see chapter 2.7).
- The flowmeter must be sealed (see chapter 2.8).
- Special density and flow DAKKS- calibration with water
- No density adjustment

Measuring ranges in custody transfer mode:

	Qmin / Qmax in kg/h	Minimum measured quantity in kg	Mass flow low cut in kg/h
RCCx34	300 / 4020	20	60
RCCx36	780 / 15600	20	156
RCCx38	2400 / 49800	100	480
RCCx39	10020 / 132000	200	2004

Operating conditions:

Maximum process pressure: 20 bar
Process temperature range: -40°C ... +55°C
Ambient temperature range: -40°C ... +55°C
Environmental class: M3 (e.g. truck mounting)
E3 (e.g. vehicle battery supply)
Accuracy class: 0.3; 0.5
Density range: (0.7 ... 1.4) kg/l

Outputs / Inputs in custody transfer mode:

Current output: 1 active, 4-20 mA
Pulse output: 1 passive, 2 channels A and B: 90° shifted pulse packets with pulse width 0.05 ms or 1 ms, optional NAMUR level
Status output: 1 passive, off-state to indicate faults and power loss
Status input: 1 passive

Measurement variables in custody transfer mode:

Mass (output on pulse output 1)
Volume (output on pulse output 1)
Density ((output on current output)
Since only one pulse output is available mass and volume can not be measured simultaneously!

Documentation for custody transfer:

	Test Report	Certificate	Documentation Folder
RCCF31	CPC-601228-01	TC 7531	TC 7531
RCCS34	CPC-900389-01	TC 7532	TC 7532
RCCS36	CPC-809370-01	TC 7532	TC 7532
RCCS38	CPC-809370-02	TC 7532	TC 7532
RCCS39	CPC-900389-01	TC 7532	TC 7532

Test reports, certificates and special documentation folders for national type approvals are available on request. The numbers of the evaluation certificates of detector and converter according OIML R 117-1 and european directive 2004/22/EC on measuring instruments (MID) are indicated on the name plates.
For integral type RCCT3x always order also the documentation for converter RCCF31.

2. INSTALLATION

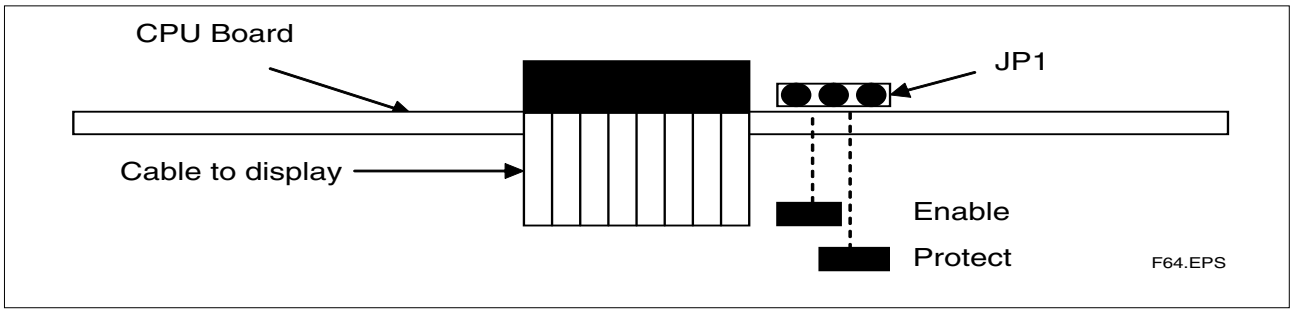
2.1 General

For installation see chapter 4 of IM 01R04B04-00E-E.
Additional regard the following chapters 2.2 and 2.3 of this manual.

2.2 Hardware Write Protect

For use in custody transfer application the hardware write protection must be set after setup:

- Open the cover of the converter.
- Unscrew the 4 screws of the display and move the display aside.
- Set the jumper on JP1 of CPU-board as shown in the following picture.
- Screw the display and close the cover.



The hardware write protection is prior to any other write protection, and cannot be released by HART or other software means.

NOTE

If the Hardware Write Protect jumper is in the "Protect" position then all parameters and commands of the list in chapter 3.2 and the menu trees in 3.3 and 3.4 can only be read in "Read only" mode.
Any writing or execution is impossible (message "Write protect"). Also Autozero is not possible.
Apply the correct value for density offset before sealing the housing!
This hardware protection can not be removed without breaking the sealing.

2.3 Sealing

Sealing is done by blocking the front window cover of the converter using the attached wire seal. The wire of the wire seal is put through the holes of the cover and the housing as shown in the figure below and then the wire is pulled through the seal again for fixing.

3. PARAMETER DESCRIPTION

3.1 Overview

The table below shows an overview of functions of ROTAMASS RCCT3/RCCF31/RCCR31.
In brackets the related chapters in this manual are indicated.

Not available for Custody Transfer type	*) = Not for Custody Transfer type or special setting requested

Topic	Parameters													
Hot key (6.3)	Write Protect HART	Enable wrt 10min. HART	New Password HART	Software seal HART	Key Status HART		Hardware Write Protect (6.4)							
Mass flow (7.5)	Mass flow unit	Mass flow format	Mass flow LRV	Mass flow URV	Mass flow damping	Mass flow lowcut *)	Mass flow alm 1sel	Mass flow alm1 crit	Mass flow alm 2 sel	Mass flow alm 2 crit	MF fix val sel *)	MF fixed value *)		
Volume flow (7.6)	Vol flow unit	Vol flow format	Vol flow LRV	Vol flow URV	Vol flow damping	Vol flow lowcut *)	Vol flow alm 1 sel	Vol flow alm 1 crit	Vol flow alm 2 sel	Vol flow alm 2 crit				
Density (7.7))	Density unit	Density format	Density LRV	Density URV	Density damping	Density lowcut *)	Density alm 1 sel	Density alm 1 crit	Density alm 2 sel	Density alm 2 crit	Ref. Density sel *)	Reference density *)	Density offset *)	Static pressure control
Temperature (7.8)	Temperature unit	Temperature format	Temperature LRV	Temperature URV	Temperature damping	Temperature alm 1 sel	Temperature alm 1 crit	Temperature alm 2 sel	Temperature alm 2 crit	Temperature fix val select *)	Temperature fixed value *)	Temperature Gain adjust *)		
Velocity (7.9)	Velocity unit													
Analog Output 1 (7.10)	Analog 1 select *)	Analog 1 alarm out	Analog 1 low LMT	Analog 1 high LMT										
Analog Output 2 (7.11)	Analog 2 select	Analog 2 alarm out	Analog 2 low LMT	Analog 2 high LMT										
Pulse/Status out 1 (7.12)	Pulse/ Stat 1 select *)	Pulse 1 select *)	Pulse 1 unit *)	Pulse 1 rate *)	Pulse 1 active mode	Pulse 1 width *)	Pulse 1 at alarm	SO1 function *)	SO1 active mode *)					
Pulse/Status out 2 (7.13)	Pulse/ Stat 2 select	Pulse 2 select	Pulse 2 unit	Pulse 2 rate	Pulse 2 active mode	Pulse 2 width	Pulse 2 at alarm	SO2 function	SO2 active mode					
Status input (7.14)	SI function	SI active mode												
HART Output (7.15)	PV is	SV is	TV is	QV is										
Totalizer (7.16)	Total flex select	Total flex unit	Total mass unit	Total volume unit	Total net unit	Total energy unit	Heat of combustion	Heat of combustion unit	Total switch select	Total limit switch	Total at alarm	Total reset cntrl	Total reset	
Display (5)	Display select	Disp. contrast	Dips. period	Language										
Diag/Service (8)	Self test/ status (8.3)	Input/ Output Test (8.4)	Zero adjustment (5.6)	Autozero (7.24)	Output trim (8.5)	History overview (8.2)	Error history (8.2)							
Special functions	Flow direction (7.17) *)	Concentration measurement (7.18)	Net flow (7.19)	Slug detection (7.20) *)	Empty pipe detection (7.21)	Corrosion detection (7.22)	Fluid max. Temp. (7.25)	Gas measurement (7.26) *)						
Detector data (7.23)	Sensor model *)	Sensor constants *)	Sensor S/N											
Device data	Distributor	Tag	Long Tag	Descriptor	Message	Date	Dev id	Universal rev	Fld dev rev	Software rev	Hardware rev	Device S/W version	Device S/W date	
HART data	Poll address	Num req preams	Num resp preams	Master reset										

Differences between display and HART setting

The ROTAMASS software is continuously improved. This leads to functions, which are different in HART (DD version 0402) and display setting (software version from 1.08.20)

NOTE

For ROTAMASS with software version 1.08.xx (xx < 20) the parameters marked with "**)" are not available. Parameters marked with "***)" are not available in software version 1.08.20.

3.2 Parameter list

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
Write protect	Select	No	-	-	R/W			-
		Yes						
Enable WRT 10 min		Acc. To HART	-	-	R/W	X		Disable
New Password	ASCII	8 characters	-	-	R/W	X		Space
Software Seal	Select	Break	-	-	R/W			-
		Keep						
Master reset	Select	Not Execute	-	-	R/W	X		Not Execute
		Execute						
Key Status	Select	Enable	-	-	R/W			Enable
		Inhibit						
Language	Select	English	-	-	R/W	X		English
		German						
		French						
		Russian						
Mass Flow	Decimal	-	0 to 5	Mass flow unit	R		-	-
Volume Flow	Decimal	-	0 to 5	Vol flow unit	R		-	-
Density	Decimal	-	0 to 5	Density unit	R		-	-
Temperature	Decimal	-	0 to 5	Temperature unit	R		-	-
F-Total flex	Decimal	-	Auto	Total flex unit	R	X	-	-
R-Total flex	Decimal	-	Auto	Total flex unit	R	X	-	-
D-Total flex	Decimal	-	Auto	Total flex unit	R	X	-	-
F-Total mass	Decimal	-	Auto	Total mass unit	R	X	-	-
R-Total mass	Decimal	-	Auto	Total mass unit	R	X	-	-
D-Total mass	Decimal	-	Auto	Total mass unit	R	X	-	-
F-Total vol	Decimal	-	Auto	Total volume unit	R	X	-	-
R-Total vol	Decimal	-	Auto	Total volume unit	R	X	-	-
D-Total vol	Decimal	-	Auto	Total volume unit	R	X	-	-
F-Total net	Decimal	-	Auto	Total net unit	R	X	-	-
R-Total net	Decimal	-	Auto	Total net unit	R	X	-	-
D-Total net	Decimal	-	Auto	Total net unit	R	X	-	-
Concentration meas	Decimal	0 to 110	0 to 5	Concentration meas unit	R		-	-
Net flow	Decimal	-	0 to 5	Mass flow unit	R		-	-
F-Total energy	Decimal	-	Auto	Total unit energy	R	X	-	-
Velocity	Decimal	-	Auto	Velocity unit	R		-	-
Drive gain	Decimal	0 to 11 (typ.)	3	V	R		-	-
Analog output 1	Decimal	-	As sel. Var.	As sel. Var.	R		-	-
Analog output 1%	Decimal	-	2	%	R		-	-
Analog output 1 mA	Decimal	-	2	mA	R		-	-

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
Analog output 2	Decimal	-	as sel. Var.	as sel. Var.	R		-	-
Analog output 2%	Decimal	-	2	%	R		-	-
Analog output 2 mA	Decimal	-	2	mA	R		-	-
Pulse output 1	Decimal	-	1	Hz	R		-	-
Status output 1	ASCII	-	-	-	R		-	-
Pulse output 2	Decimal	-	1	Hz	R		-	-
Status output 2	ASCII	-	-	-	R		-	-
View input	ASCII	-	-	-	R		-	-
Self Test	Select	Not Execute	-	-	R/W		X	Not Execute
		Execute						
Status	ASCII	Results of last self test	-	-	R		-	-
Hist Overview ord	ASCII	-	-	-	R		-	-
Hist Overview abs	ASCII	-	-	-	R		-	-
Error History	ASCII	-	-	-	R		-	-
Analog output 1 (Test)	Decimal	2.0 to 22.0	2	mA	W	X	X	4
Analog output 2 (Test)	Decimal	2.0 to 22.0	2	mA	W	X	X	4
Pulse output 1 (Test)	Decimal	0 to 10000	1	Hz	W	X	X	1000
Status Output 1 (Test) *)	Select	On Active	-	-	W	X	X	On Active
		Off Active						
Pulse output 2 (Test)	Decimal	0 to 2000	1	Hz	W	X	X	1000
Status Output 2 (Test)	Select	On Active	-	-	W	X	X	On Active
		Off Active						
Status input (Test)	ASCII	Open/Short	-	-	R		-	-
Autozero tuning	Select	Inhibit	-	-	R/W	X	X	Inhibit
		Enable						
Autozero Time	Select	3 min	-	-	R/W	X	X	3 min
		30 s						
Autozero Exe	Select	Not Execute	-	-	Exe	X	X	Not Execute
		Execute						
Autozero Value	Decimal	depends on size	3	kg/h	R	X		0
Autozero History	ASCII	-	-	-	R	X	-	-
Autozero initial	Decimal	depends on size	3	kg/h	R	X	-	-
Autozero range	Decimal	depends on size	3	kg/h	R		-	-
Autozero fluctuation range	Decimal	depends on size	3	kg/h	R	X	-	-
Output Trim AO 1 trim 4mA	Decimal	ACC To HART	-	-	R/W		-	0
Output Trim AO 2 trim 4mA	Decimal	ACC To HART	-	-	R/W		-	0
Output Trim AO 1 trim 20mA	Decimal	ACC To HART	-	-	R/W		-	0
Output Trim AO 2 trim 20mA	Decimal	ACC To HART	-	-	R/W		-	0
Tag	ASCII	8 characters	-	-	R/W			Space
Long Tag	ASCII	22 characters	-	-	R/W			Space

IM 01R04B07-00E-E 3rd edition July 01, 2013-00

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
Disp select 1	Select	Mass flow	-	-	R/W	X		Mass flow
		Volume flow						
		Density						
		Temperature						
		Concentration						
		Net flow						
		F-Total flex						
		R-Total flex						
		D-Total flex						
		F-Total mass						
		R-Total mass						
		D-Total mass						
		F-Total volume						
		R-Total volume						
		D-Total volume						
		F-Total net						
		R-Total net						
		D-Total net						
		F-Total energy						
		Velocity						
		Drive gain						
Disp select 2	Select	Mass flow	-	-	R/W	X		Density
		Volume flow						
		Density						
		Temperature						
		Concentration						
		Net flow						
		F-Total flex						
		R-Total flex						
		D-Total flex						
		F-Total mass						
		R-Total mass						
		D-Total mass						
		F-Total volume						
		R-Total volume						
		D-Total volume						
		F-Total net						
		R-Total net						
		D-Total net						
		F-Total energy						
		Velocity						
		Drive gain						
		None						

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
Disp select 3	Select	Mass flow	-	-	R/W	X		Temperature
		Volume flow						
		Density						
		Temperature						
		Concentration						
		Net flow						
		F-Total flex						
		R-Total flex						
		D-Total flex						
		F-Total mass						
		R-Total mass						
		D-Total mass						
		F-Total volume						
		R-Total volume						
		D-Total volume						
		F-Total net						
		R-Total net						
		D-Total net						
		F-Total energy						
		Velocity						
		Drive gain						
		None						
Disp select 4	Select	Mass flow	-	-	R/W	X		F-Total mass
		Volume flow						
		Density						
		Temperature						
		Concentration						
		Net flow						
		F-Total flex						
		R-Total flex						
		D-Total flex						
		F-Total mass						
		R-Total mass						
		D-Total mass						
		F-Total volume						
		R-Total volume						
		D-Total volume						
		F-Total net						
		R-Total net						
		D-Total net						
		F-Total energy						
		Velocity						
		Drive gain						
		None						

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
Disp contrast	Select	-5	-	-	R/W	X		0
		-4						
		-3						
		-2						
		-1						
		0						
		1						
		2						
		3						
		4						
		5						
Disp Period	Select	0.5 s	-	-	R/W	X		1.0 s
		1.0 s						
		2.0 s						
Flow direction *)	Select	Forward	-	-	R/W	X		Forward
		Reverse						
Mass flow unit	Select	g/s	-	-	R/W	X		RCCS30LR …33: l/h RCCS34…39/ XR: m^3/h
		g/min						
		g/h						
		kg/s						
		kg/min						
		kg/h						
		kg/d						
		t/min						
		t/h						
		t/d						
		lb/s						
		lb/min						
		lb/h						
		lb/d						
Mass flow format	Select	xxxxxxx	-	-	R/W	X		xxxx.XX
		xxxxx.X						
		xxxx.XX						
		xxx.XXX						
		xx.XXXX						
		x.XXXXX						
Mass flow LRV	Decimal	-Qmax to Qmax	0 to 5	Mass flow unit	R/W	X		0
Mass flow URV	Decimal	-Qmax to Qmax	0 to 5	Mass flow unit	R/W	X		Qnom
Mass flow damping	Decimal	0 to 200	1	Sec.	R/W	X		3
Mass flow lowcut *)	Decimal	-Qmax to Qmax	0 to 5	Mass flow unit	R/W	X		0
Mass flow alm 1 sel	Select	No function	-	-	R/W	X		No function
		More than						
		Less than						
Mass flow alm 1 crit	Decimal	-110% to 110% of URV	0 to 5	Mass flow unit	R/W	X		0
Mass flow alm 2 sel	Select	No function	-	-	R/W	X		No function
		More than						
		Less than						
Mass flow alm 2 crit	Decimal	-110% to 110% of URV	0 to 5	Mass flow unit	R/W	X		10
Mass flow fix val sel *)	Select	Inhibit	-	-	R/W	X		Inhibit
		Enable						
Mass flow fixed val *)	Decimal	0 to Qnom	0 to 5	Mass flow unit	R/W	X		0

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
Vol flow unit	Select	cm^3/s	-	-	R/W	X		RCCS30LR …33: l/h RCCS34…39/ XR: m^3/h
		cm^3/min						
		cm^3/h						
		l/s						
		l/min						
		l/h						
		l/d						
		m^3/s						
		m^3/min						
		m^3/h						
		m^3/d						
		gal/s						
		gal/min						
		gal/h						
		gal/d						
		Cuft/s						
		Cuft/min						
		Cuft/h						
		Cuft/d						
		bbl/s						
		bbl/min						
		bbl/h						
		bbl/d						
		Impgal/s						
		Impgal/min						
		Impgal/h						
		Impgal/d						
		l(N)/s *)						
		l(N)/min *)						
		l(N)/h *)						
		l(N)/d *)						
		$m^3(N)/s$ *)						
		$m^3(N)/min$ *)						
		$m^3(N)/h$ *)						
		$m^3(N)/d$ *)						
		Sl/s *)						
		Sl/min *)						
		Sl/h *)						
		Sl/d *)						
		Scuft/s *)						
		Scuft/min *)						
		Scuft/h *)						
		Scuft/d *)						
		Sm^3/s *)						
		Sm^3/min *)						
		Sm^3/h *)						
		Sm^3/d *)						
Vol flow format	Select	xxxxxxx	-	-	R/W	X		xxxx.XX
		xxxxx.X						
		xxxx.XX						
		xxx.XXX						
		xx.XXXX						
		x.XXXXX						

IM 01R04B07-00E-E 3rd edition July 01, 2013-00

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
Vol flow LRV	Decimal	-Qvmax to Qvmax	0 to 5	Vol flow unit	R/W	X		0
Vol flow URV	Decimal	-Qvmax to Qvmax	0 to 5	Vol flow unit	R/W	X		Qvnom
Vol flow damping	Decimal	0 to 200	1	Sec.	R/W	X		3
Vol flow lowcut *)	Decimal	-Qvmax to Qvmax	0 to 5	Vol flow unit	R/W	X		0
Vol flow alm 1 sel	Select	No function	-	-	R/W	X		No function
		More than						
		Less than						
Vol flow alm 1 crit	Decimal	-110% to 110% of URV	0 to 5	Vol flow unit	R/W	X		0
Vol flow alm 2 sel	Select	No function	-	-	R/W	X		No function
		More than						
		Less than						
Vol flow alm 2 crit	Decimal	-110% to 110% of URV	0 to 5	Vol flow unit	R/W	X		10
Density unit	Select	g/ml	-	-	R/W	X		kg/l
		kg/l						
		kg/m³						
		lb/gal						
		lb/Cuft						
		g/cm³						
		g/l						
		°Bé hv *)						
		°Bé lt *)						
		°API *)						
Density format	Select	xxxxxxx	-	-	R/W	X		xx.XXXX
		xxxxx.X						
		xxxx.XX						
		xxx.XXX						
		xx.XXXX						
		x.XXXXX						
Density LRV	Decimal	0 to 5 kg/l	0 to 5	Density unit	R/W	X		0.0
Density URV	Decimal	0 to 5 kg/l	0 to 5	Density unit	R/W	X		1.5
Density damping	Decimal	0 to 200	1	Sec.	R/W	X		15.0
Density lowcut *)	Decimal	0 to 5 kg/l	0 to 5	Density unit	R/W	X		0.0
Density alm 1 sel	Select	No function	-	-	R/W	X		No function
		More than						
		Less than						
Density alm1 crit	Decimal	0 to 5 kg/l	0 to 5	Density unit	R/W	X		LRV
Density alm 2 sel	Select	No function	-	-	R/W	X		No function
		More than						
		Less than						
Density alm 2 crit	Decimal	0 to 5 kg/l	0 to 5	Density unit	R/W	X		URV
Ref. Density sel *) **)	Select	Inhibit	-	-	R/W	X		Inhibit
		Fixed						
		Calculated						
Density fix val sel *) ***)	Select	Inhibit	-	-	R/W	X		Inhibit
		Enable *)						
Reference Density *)	Decimal	0 to 5 kg/l	0 to 5	Density unit	R/W	X		1.0
Density offset *)	Decimal	-9999.99 to +9999.99	2	g/l	R/W	X		0
Pressure	Decimal	0 to 400	2	bar	R/W			0
Pressure unit	Select	bar	-	-	R/W			bar
		psi						
		MPa						

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
Temperature unit	Select	degC	-	-	R/W	X		degC
		degF						
		K						
Temperature format	Select	xxxxxxx	-	-	R/W	X		xxxxxx.X
		xxxxx.X						
		xxxx.XX						
		xxx.XXX						
		xx.XXXX						
		x.XXXXX						
Temperature LRV	Decimal	Standard: -200 to 230°C	0 to 5	Temperature unit	R/W	X		-200
		High Temp.: 0 to 400°C						
Temperature URV	Decimal	Standard: -200 to 230°C	0 to 5	Temperature unit	R/W	X		230
		High Temp.: 0 to 400°C						
Temperature damping	Decimal	0 to 200	1	Sec.	R/W	X		3
Temp alm 1 sel	Select	No function	-	-	R/W	X		No function
		More than						
		Less than						
Temp alm 1 crit	Decimal	Standard: -200 to 200°C	0 to 5	Temperature unit	R/W	X		LRV
Temp alm 2 sel	Select	No function	-	-	R/W	X		No function
		More than						
		Less than						
Temp alm 2 crit	Decimal	Standard: -200 to 230°C	0 to 5	Temperature unit	R/W	X		URV
		High Temp.: 0 to 400°C						
Temp fix val select *)	Select	Inhibit	-	-	R/W	X	X	Inhibit
		Enable						
Temp fixed val *)	Decimal	Standard: -200 to 230°C	1	Temperature unit	R/W	X	X	30
		High Temp.: 0 to 400°C						
Temp gain *)	Decimal	0.8 to 1.2	3	-	R/W			1
Velocity unit	Select	m/s	-	-	R/W	X		m/s
		ft/s						
Analog 1 select *)	Select	Mass flow	-	-	R/W	X		Mass flow
		Volume flow						
		Density						
		Temperature						
		Concentration meas						
		Net flow						
		None						
Analog 1 alarm out	Select	<2.4mA	-	-	R/W	X		<3.6mA
		<3.6mA						
		4.0mA						
		>21mA						
		>21.6mA						
		Hold						
		Measured Value						
Analog 1 low LMT	Decimal	2.4 to 21.6 mA	2	mA	R/W	X		3.8
Analog 1 high LMT	Decimal	2.4 to 21.6 mA	2	mA	R/W	X		20.5
Analog 2 select	Select	Mass flow	-	-	R/W	X		Density
		Volume flow						
		Density						
		Temperature						
		Concentration meas						
		Net flow						
		None						

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
Analog 2 alarm out	Select	<2.4mA	-	-	R/W	X		<3.6mA
		<3.6mA						
		4.0mA						
		>21mA						
		>21.6mA						
		Hold						
		Measured Value						
Analog 2 low LMT	Decimal	2.4 to 21.6 mA	2	mA	R/W	X		3.8
Analog 2 high LMT	Decimal	2.4 to 21.6 mA	2	mA	R/W	X		20.5
Pulse/Stat 1 select *)	Select	Pulse	-	-	R/W	X		Pulse
		Status out *)						
		No function *)						
Pulse 1 select *)	Select	Mass flow	-	-	R/W	X		F-Total mass
		Volume flow						
		Density						
		Temperature						
		Concentration						
		Net flow						
		None						
		F-Total mass						
		R-Total mass						
		F-Total volume						
		R-Total volume						
		F-Total net *)						
		R-Total net *)						
Pulse 1 unit *)	Select	Hz	-	-	R/W	X		kg/P
		g/P						
		kg/P *)						
		t/P *)						
		lb/P *)						
		cm^3/P						
		l/P *)						
		m^3/P *)						
		gal/P *)						
		kgal/P *)						
		Cuft/P *)						
		bbl/P *)						
		Impgal/P *)						
		kImpgal/P *)						
		l(N)/P *)						
		m^3(N)/P *)						
		Sl/P *)						
		Scuft/P *)						
		Sm^3/P *)						
Pulse 1 rate *) *)	Decimal	0 to 11000 Unit/ P 0 to 10000 Hz	0 to 5 0	Pulse 1 unit	R/W	X		1 kg/P
Pulse 1 active mode	Select	On Active	-	-	R/W	X		On Active
		Off Active						

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
Pulse 1 width *)	Select	0.05ms	-	-	R/W	X		1ms
		0.1ms *)						
		0.5ms *)						
		1ms						
		5ms *)						
		10ms *)						
		50ms *)						
		100ms *)						
		500ms *)						
		1000ms *)						
Pulse 1 at alarm	Select	0P/0Hz	-	-	R/W	X		0P/Hz
		Measured Value						
		Hold						
SO 1 function *)	Select	No function	-	-	R/W	X		No function
		Flow-Direction						
		Total limit switch						
		Mass flow alm 1						
		Mass flow alm 2						
		Mass flow alm 1+2						
		Vol flow alm 1						
		Vol flow alm 2						
		Vol flow alm 1+2						
		Density alm 1						
		Density alm 2						
		Density alm 1+2						
		Temp alm 1						
		Temp alm 2						
		Temp alm 1+2						
		Concentr. meas alm 1						
		Concentr. meas alm 2						
		Concentr. meas alm 1+2						
		Net flow alm 1						
		Net flow alm 2						
		Net flow alm 1+2						
		Slug alarm						
		Empty alarm						
		Corrosion alarm						
		All alarms						
		All errors						
		All alarms & errors						
SO 1 active mode *)	Select	On Active	-	-	R/W	X		On Active
		Off Active						
Pulse/Stat 2 select	Select	Pulse	-	-	R/W	X		Status out
		Status out						
		No function						

IM 01R04B07-00E-E 3rd edition July 01, 2013-00

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
Pulse 2 select	Select	Mass flow	-	-	R/W	X		Temperature
		Volume flow						
		Density						
		Temperature						
		Concentration						
		Net flow						
		None						
		F-Total mass						
		R-Total mass						
		F-Total volume						
		R-Total volume						
		F-Total net						
		R-Total net						
Pulse 2 unit	Select	Hz	-	-	R/W	X		Hz
		g/P						
		kg/P						
		t/P						
		lb/P						
		cm^3/P						
		l/P						
		m^3/P						
		gal/P						
		kgal/P						
		Cuft/P						
		bbl/P						
		Impgal/P						
		klmpgal/P						
		l(N)/P *)						
		m^3(N)/P *)						
		Sl/P *)						
		Scuft/P *)						
		Sm^3/P *)						
Pulse 2 rate	Decimal	0 to 11000 Unit/P 0 to 2000 Hz	0 to 5 0	Pulse 2 unit	R/W	X		2000 Hz
Pulse 2 active mode	Select	On Active	-	-	R/W	X		On Active
		Off Active						
Pulse 2 width	Select	0.05ms	-	-	R/W			1ms
		0.1ms						
		0.5ms						
		1ms						
		5ms						
		10ms						
		50ms						
		100ms						
		500ms						
		1000ms						
Pulse 2 at alarm	Select	0P/0Hz	-	-	R/W	X		0P/0Hz
		Measured Value						
		Hold						

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
SO 2 function	Select	No function	-	-	R/W	X		No Function
		Flow-Direction						
		Total limit switch						
		Mass flow alm 1						
		Mass flow alm 2						
		Mass flow alm 1+2						
		Vol flow alm 1						
		Vol flow alm 2						
		Vol flow alm 1+2						
		Density alm 1						
		Density alm 2						
		Density alm 1+2						
		Temp alm 1						
		Temp alm 2						
		Temp alm 1+2						
		Concentr. meas alm 1						
		Concentr. meas alm 2						
		Concentr. meas alm 1+2						
		Net flow alm 1						
		Net flow alm 2						
		Net flow alm 1+2						
		Slug alarm						
		Empty alarm						
		Corrosion alarm						
		All alarms						
		All errors						
		All alarms & errors						
SO 2 active mode	Select	On active	-	-	R/W	X		On active
		Off active						
PV is	Select	Mass flow	-	-	R/W	X		Mass flow
		Volume flow						
		Density						
		Temperature						
		Concentration meas						
		Net flow						
		None						

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
SV is	Select	Mass flow	-	-	R/W	X		Density
		Volume flow						
		Density						
		Temperature						
		Concentration meas						
		Net flow						
		None						
		F-Total flex						
		R-Total flex						
		D-Total flex						
		F-Total mass						
		R-Total mass						
		D-Total mass						
		F-Total volume						
		R-Total volume						
		D-Total volume						
		F-Total net						
		R-Total net						
		D-Total net						
		F-Total energy						
		Velocity						
		Drive gain						
TV is	Select	Mass flow	-	-	R/W	X		F-Total mass
		Volume flow						
		Density						
		Temperature						
		Concentration meas						
		Net flow						
		None						
		F-Total flex						
		R-Total flex						
		D-Total flex						
		F-Total mass						
		R-Total mass						
		D-Total mass						
		F-Total volume						
		R-Total volume						
		D-Total volume						
		F-Total net						
		R-Total net						
		D-Total net						
		F-Total energy						
		Velocity						
		Drive gain						

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
QV is	Select	Mass flow	-	-	R/W	X		Temperature
		Volume flow						
		Density						
		Temperature						
		Concentration meas						
		Net flow						
		None						
		F-Total flex						
		R-Total flex						
		D-Total flex						
		F-Total mass						
		R-Total mass						
		D-Total mass						
		F-Total volume						
		R-Total volume						
		D-Total volume						
		F-Total net						
		R-Total net						
		D-Total net						
		F-Total energy						
		Velocity						
		Drive gain						
SI function	Select	No function	-	-	R/W	X		No function
		Autozero						
		Reset flex totals						
		Reset mass totals						
		Reset volume totals						
		Reset net totals						
		Reset all totals						
		0% Signal lock						
SI Active mode	Select	On active	-	-	R/W	X		On Active
		Off active						
Total flex select	Select	Flex total	-	-	R/W	X		Flex total
		Mass total						
		Volume total						
		Net total						

IM 01R04B07-00E-E 3rd edition July 01, 2013-00

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
Total flex unit	Select	g	-	-	R/W	X		kg
		kg						
		t						
		lb						
		cm^3						
		l						
		m^3						
		gal						
		kgal						
		Cuft						
		bbl						
		Impgal						
		klmpgal						
		l(N) *)						
		m^3(N) *)						
		Sl *)						
		Scuft *)						
		MMscuft *)						
		Sm^3 *)						
Total mass unit	Select	g	-	-	R/W	X		kg
		kg						
		t						
		lb						
Total volume unit	Select	cm^3	-	-	R/W	X		l
		l						
		m^3						
		gal						
		kgal						
		Cuft						
		bbl						
		Impgal						
		klmpgal						
		l(N) *)						
		m^3(N) *)						
		Sl *)						
		Scuft *)						
		MMscuft *)						
		Sm^3 *)						
Total net unit	Select	g	-	-	R/W	X		kg
		kg						
		t						
		lb						
		cm^3						
		l						
		m^3						
		gal						
		kgal						
		Cuft						
		bbl						
		Impgal						
		klmpgal						
Total switch select	Select	Mass	-	-	R/W	X		Mass
		Volume						
		Net						

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
Total limit switch	Decimal	0 to 9999999	0 to 5	Total unit	R/W	X		0
Total unit energy	Select	MJ	-	-	R/W	X		MJ
		Btu						
Energy factor/ heat of combustion	Decimal	0 to 100000	0 to 5	heat of combust unit	R/W			10
Energy factor/ heat of combust unit	Select	MJ/kg	-	-	R/W	X		MJ/kg
		Btu/lb						
		MJ/m³(N) *)						
		Btu/Scuft *)						
Total at alarm	Select	Hold	-	-	R/W	X		Hold
		Continue Total						
Total reset cntrl	Select	Inhibit	-	-	R/W	X		Inhibit
		Enable						
Total reset	Select	Not Execute	-	-	R/W	X	X	Not Execute
		Reset flex totals						
		Reset mass totals						
		Reset volume totals						
		Reset net totals						
		Reset all totals						
SK20 *)	Decimal		0 to 5	MHz×kg/h	R/W			124
SKT *)	Decimal		0 to 5	E-4×1/K	R/W			-7,34
SKTK *)	Decimal		0 to 5	E-7×1/K²	R/W			19,6
RV *)	Decimal		0 to 5	%/(kg/l)	R/W			0,24
Qnom *)	Decimal		auto	Mass flow unit	R			10
KD *)	Decimal		0 to 5	kg/l	R/W			4,4
fl20 *)	Decimal		0 to 5	Hz	R/W			177,1
FTC1 *)	Decimal		0 to 5	E-4×1/K	R/W			-2,179
FTCK *)	Decimal		0 to 5	E-7×1/K²	R/W			-0,539
SKP *)	Decimal		0 to 5	E-4×1/bar	R/W			-0,346
SKPT *)	Decimal		0 to 5	E-7×1/(bar×K)	R/W			0
FPC *)	Decimal		0 to 5	E-4×1/bar	R/W			0,173
FPTC *)	Decimal		0 to 5	E-7×1/(bar×K)	R/W			0,02
FQC1 *)	Decimal		0 to 5	E-10×s/g	R/W			0
FQC2 *)	Decimal		0 to 5	E-13×(s/g)²	R/W			-40,8
Poll Adress	Decimal	0 to 15	0	-	R/W			0
Num req pream	Decimal		0	-	R			5
Num resp pream	Decimal	5 to 20	0	-	R/W			5
Reference temperature	Decimal		1	Temperature unit	R/W	X		25
Ref. density carrier	Decimal		0 to 5	Density unit	R/W	X		0,997
Temp. coeff. a carrier	Decimal		0 to 5	E-3×(1/Temp unit)	R/W	X		-0,261
Temp. coeff. b carrier	Decimal		0 to 5	E-5×(1/Temp unit²)	R/W	X		-0,36
Ref. density product	Decimal		0 to 5	Density unit	R/W	X		0
Temp. coeff. a product	Decimal		0 to 5	E-3×(1/Temp unit)	R/W	X		0
Temp. coeff. b product	Decimal		0 to 5	E-5×(1/Temp unit²)	R/W	X		0
Temp. coeff. a **)	Decimal		0 to 5	E-3×(1/Temp unit)	R/W	X		0
Temp. coeff. b **)	Decimal		0 to 5	E-5×(1/Temp unit²)	R/W	X		0
Concentration meas unit	Select	°Brix	-	-	R/W	X		Wt-%
		Wt -% sol				X		
		Vol % sol				X		
		Wt -%				X		
		Vol %				X		

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
Concentration meas format	Select	xxxxxxx	-	-	R/W	X		xxxx.XX
		xxxxx.X				X		
		xxxx.XX				X		
		xxx.XXX				X		
		xx.XXXX				X		
		x.XXXXX				X		
Concentration meas LRV	Decimal	0 to 110	0 to 5	Concentration meas unit	R/W	X		0
Concentration meas URV	Decimal	0 to 110	0 to 5	Concentration meas unit	R/W	X		100
Concentration meas Damp	Decimal	0 to 200	1	Sec	R/W	X		10
Concentration meas lowcut	Decimal	0 to 10%	0 to 5	Concentration meas unit	R/W			0
Conc meas alm 1 sel	Select	No function	-	-	R/W	X		No function
		More than						
		Less than						
Conc meas alm 1 crit	Decimal	0 to 110% of URV	0 to 5	Concentration meas unit	R/W	X		LRV
Conc meas alm 2 sel	Select	No function	-	-	R/W	X		No function
		More than						
		Less than						
Conc meas alm 2 crit	Decimal	0 to 110% of URV	0 to 5	Concentration meas unit	R/W	X		URV
Net flow select	Select	Mass	-	-	R/W	X		Mass
		Volume						

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
Net flow unit	Select	g/s	-	-	R/W	X		RCCS30LR-33: kg/h RCCS34-39/ XR: t/h
		g/min						
		g/h						
		kg/s						
		kg/min						
		kg/h						
		t/min						
		t/h						
		lb/s						
		lb/min						
		lb/h						
		cm^3/s						
		cm^3/min						
		cm^3/h						
		l/s						
		l/min						
		l/h						
		l/d						
		m^3/s						
		m^3/min						
		m^3/h						
		m^3/d						
		gal/s						
		gal/min						
		gal/h						
		gal/d						
		Cuft/s						
		Cuft/min						
		Cuft/h						
		Cuft/d						
		bbl/s						
		bbl/min						
		bbl/h						
		bbl/d						
		Impgal/s						
		Impgal/min						
		Impgal/h						
		Impgal/d						
Net flow format	Select	xxxxxxx	-	-	R/W	X		xxxx.XX
		xxxxx.X						
		xxxx.XX						
		xxx.XXX						
		xx.XXXX						
		x.XXXXX						
Net flow LRV	Decimal	-Qmax to Qmax	0 to 5	Net flow unit	R/W	X		0
Net flow URV	Decimal	-Qmax to Qmax	0 to 5	Net flow unit	R/W	X		Qnom
Net flow damping	Decimal	0 to 200	1	Sec	R/W	X		3
Net flow lowcut	Decimal	-Qmax to Qmax	0 to 5	Net flow unit	R/W	X		0.0
Net flow alm 1 sel	Select	No function	-	-	R/W	X		No function
		More than						
		Less than						
Net flow alm 1 crit	Decimal	-110% to 110% of URV	0 to 5	Net flow unit	R/W	X		LRV

Parameter	Data form	Data range	Dec. point	Unit	R : read W : write Exe : execute	Reset Master	Reset Power on	Default
Net flow alm 2 sel	Select	No function	-	-	R/W	X		No function
		More than						
		Less than						
Net flow alm 2 crit	Decimal	-110% to 110% of URV	0 to 5	Net flow unit	R/W	X		URV
Measuring range	Select	Namur	-	-	R			Namur
		Not Namur						
Slug alarm select *)	Select	Not Apply	-	-	R/W	X		Not Apply
		Apply						
Drive gain *)	Decimal	0 to 11 (typ.)	3	V	R			-
Slug criteria *)	Decimal	0 to 13.3	3	V	R/W	X		11
Slug duration *)	Decimal	0 to 120	0	Sec.	R/W	X		1
After slug	Select	Measured value	-	-	R/W	X		Measured value
		Hold						
Drive gain damping	Decimal	0 to 200	1	Sec.	R/W	X		1
Empty pipe alm sel	Select	Not Apply	-	-	R/W	X		Not Apply
		Apply						
Empty pipe crit	Decimal	0 to Density URV	0 to 5	Density unit	R/W	X		0
After empty pipe	Select	Massflow=Zero	-	-	R/W	X		Massflow=
		Measured value						Zero
		Hold						
Corrosion alm sel	Select	Not Apply	-	-	R/W	X		Not Apply
		Apply						
Corrosion criteria	Decimal	0 to Density URV	0 to 5	Density unit	R/W	X		1,5
Corrosion damp	Decimal	0 to 10	1	h	R/W	X		10
Fluid max temp	Decimal	-	1	Temperature unit	R			-
Distributor	ASCII	-	-	-	R			Yokogawa
Descriptor	ASCII	16 characters	-	-	R/W			Space
Message	ASCII	32 characters	-	-	R/W			Space
Date	ASCII	dd/mm/yyyy	-	-	R/W			01/01/2011
Sensor model *)	Select	RCCS30LR *)	-	-	R/W			RCCS36
		RCCS30 *)						
		RCCS31 *)						
		RCCS32 *)						
		RCCS33 *)						
		RCCS34						
		RCCS36						
		RCCS38						
		RCCS39						
		RCCS39/IR *)						
		RCCS39/XR *)						
Sensor S/N	Decimal	7 digits	-	-	R			0 (not used)
Assembly number	Decimal	7 digits	-	-	R			0 (not used)
Serial no. Converter	ASCII	16 char.	-	-	R			fix
Serial no. Detector	ASCII	16 char.	-	-	R			fix
Universal rev	Decimal	7 digits	-	-	R			fix
Fld. dev rev.	Decimal	3 digits	-	-	R			fix
Software rev	Decimal	3 digits	-	-	R			fix
Hardware rev	Decimal	3 digits	-	-	R			fix
Device id	Decimal	7 digits	-	-	R			7xxxxxx
Device S/W version	ASCII	20 char.	-	-	R			RCCT3 Vx.xx.xx Rx-x-x
Device S/W date	ASCII	dd/mm/yyyy	-	-	R			xx/xx/xxxx

3.3 Parameter tree, Display menu

Language	English				
	German				
	French				
	Russian				

Process Variables	View fld dev vars	Mass flow			R
		Volume flow			R
		Density			R
		Temperature			R
		Concentration meas			R
		Net flow			R
		F-Total flex			R
		R-Total flex			R
		D-Total flex			R
		F-Total mass			R
		R-Total mass			R
		D-Total mass			R
		F-Total volume			R
		R-Total volume			R
		D-Total volume			R
		F-Total net			R
		R-Total net			R
		D-Total net			R
		F-Total energy			R
		Velocity			R
		Drive gain			R
	View outputs	Analog output 1	Analog Output 1		R
			Analog Output 1%		R
			Analog Output 1mA		R
		Analog output 2	Analog Output 2		R
			Analog Output 2%		R
			Analog Output 2mA		R
		Pulse/Status out 1	Pulse output 1		R
			Status output 1		R
		Pulse/Status out 2	Pulse output 2		R
			Status output 2		R
	View input				R
	Totalizer	Total reset cntrl	Inhibit		Sel
			Enable		
			Total reset	Not Execute	
				Reset flex totals	EXE
				Reset mass totals	EXE
				Reset volume totals	EXE
				Reset net totals	EXE
				Reset all totals	EXE

Diag/Service	Self test/Status	Self Test	LCD Test	EXE
			Self Test	EXE
			Key Test	EXE
		Status	Event Overview	R
			Error	R
			Alarm	R
			Warning	R
		Hist Overfiew ord	Hist Overview ord	R
			Clear History	EXE
		Hist Overfiew abs	Hist Overview abs	R
			Error	R
			Alarm	R
			Warning	R
			Clear History	EXE
		Error History		R
	Input/Output test	Analog output 1		R/W
		Analog output 2		R/W
		Pulse output 1		R/W
		Status output 1 *)		R/W
		Pulse output 2		R/W
		Status output 2		R/W
		Status input		R
	Auto zero check	Autozero history		R
		Autozero initial		R
		Autozero range		R
		Autozero fluctuation range		R
	Autozero	Zero tuning	**Inhibit**	Sel
			Enable	
		Autozero time	**3min**	Sel
			30s	
		Autozero Exe		EXE
		Autozero value		R
	Output trim	AO 1 trim 4mA		EXE
		AO 1 trim 20mA		EXE
		AO 2 trim 4mA		EXE
		AO 2 trim 20mA		EXE

Basic Setup	Tag			R/W
	Long Tag			R/W
	Display config	Disp select 1	**Mass flow**	Sel
			Volume flow	
			Density	
			Temperature	
			Concentration meas	
			Net flow	
			F-Total flex	
			R-Total flex	
			D-Total flex	
			F-Total mass	
			R-Total mass	
			D-Total mass	
			F-Total volume	
			R-Total volume	
			D-Total volume	
			F-Total net	
			R-Total net	
			D-Total net	
			F-Total energy	
			Velocity	
			Drive gain	
		Disp select 2	Mass flow	Sel
			Volume flow	
			Density	
			Temperature	
			Concentration meas	
			Net flow	
			F-Total flex	
			R-Total flex	
			D-Total flex	
			F-Total mass	
			R-Total mass	
			D-Total mass	
			F-Total volume	
			R-Total volume	
			D-Total volume	
			F-Total net	
			R-Total net	
			D-Total net	
			F-Total energy	
			Velocity	
			Drive gain	
			None	

Basic Setup		Disp select 3	Mass flow	Sel
			Volume flow	
			Density	
			Temperature	
			Concentration meas	
			Net flow	
			F-Total flex	
			R-Total flex	
			D-Total flex	
			F-Total mass	
			R-Total mass	
			D-Total mass	
			F-Total volume	
			R-Total volume	
			D-Total volume	
			F-Total net	
			R-Total net	
			D-Total net	
			F-Total energy	
			Velocity	
			Drive gain	
			None	
		Disp select 4	Mass flow	Sel
			Volume flow	
			Density	
			Temperature	
			Concentration meas	
			Net flow	
			F-Total flex	
			R-Total flex	
			D-Total flex	
			F-Total mass	
			R-Total mass	
			D-Total mass	
			F-Total volume	
			R-Total volume	
			D-Total volume	
			F-Total net	
			R-Total net	
			D-Total net	
			F-Total energy	
			Velocity	
			Drive gain	
			None	

Basic Setup		Display contrast	-5	Sel
			-4	
			-3	
			-2	
			-1	
			0	
			+1	
			+2	
			+3	
			+4	
			+5	
	Mass flow	Mass flow unit	g/s	Sel
			g/min	
			g/h	
			kg/s	
			kg/min	
			kg/h	
			kg/d	
			t/min	
			t/h	
			t/d	
			lb/s	
			lb/min	
			lb/h	
			lb/d	
		Mass flow LRV		R/W
		Mass flow URV		R/W
		Mass flow damping		R/W
	Density	Density unit	g/ml	Sel
			kg/l	
			kg/m³	
			lb/gal	
			lb/Cuft	
			g/cm³	
			g/l	
			°Bé hv *)	
			°Bé lt *)	
			°API *)	
		Density LRV		R/W
		Density URV		R/W
		Density damping		R/W

Basic Setup	Temperature	Temperature unit	**degC**	Sel
			degF	
			K	
		Temperature LRV		R/W
		Temperature URV		R/W
		Temperature damping		R/W
	Analog 1 select *)	Mass flow		Sel
		Volume flow		
		Density		
		Temperature		
		Concentration meas		
		Net flow		
		None		
	Analog 2 select	Mass flow		Sel
		Volume flow		
		Density		
		Temperature		
		Concentration meas		
		Net flow		
		None		
	Pulse/Status out 1	Pulse/Stat 1 select	**Pulse**	Sel
			Status Out *)	
			No Function *)	
		Pulse 1 select	Mass flow	Sel
			Volume flow	
			Density	
			Temperature	
			Concentration meas	
			Net flow	
			None	
			F-Total mass	
			R-Total mass	
			F-Total volume	
			R-Total volume	
			F-Total net	
			R-Total net	

Basic Setup		Pulse 1 unit	Hz	Sel
			g/P	
			kg/P *)	
			t/P *)	
			lb/P *)	
			cm^3/P	
			l/P *)	
			m^3/P *)	
			gal/P *)	
			kgal/P *)	
			Cuft/P *)	
			bbl/P *)	
			Impgal/P *)	
			kImpgal/P *)	
			I(N)/P *)	
			m^3(N)/P *)	
			Sl/P *)	
			Scuft/P *)	
			Sm^3/P *)	
		Pulse 1 rate		R/W
		SO 1 function *)	**No Function**	Sel
			Flow direction	
			Total limit switch	
			Mass flow alm 1	
			Mass flow alm 2	
			Mass flow alm 1+2	
			Vol flow alm 1	
			Vol flow alm 2	
			Vol flow alm 1+2	
			Density alm 1	
			Density alm 2	
			Density alm 1+2	
			Temp alm 1	
			Temp alm 2	
			Temp alm 1+2	
			Concentr. meas alm 1	
			Concentr. meas alm 2	
			Concentr. meas alm 1+2	
			Net flow alm 1	
			Net flow alm 2	
			Net flow alm 1+2	
			Slug Alarm	
			Empty alarm	
			Corrosion Alarm	
			All alarms	
			All errors	
			All alarms & errors	

Basic Setup	Pulse/Status out 2	Pulse/Stat 2 select	Pulse	Sel
			Status Out	
			No Function	
		Pulse 2 select	Mass flow	Sel
			Volume flow	
			Density	
			Temperature	
			Concentration meas	
			Net flow	
			None	
			F-Total mass	
			R-Total mass	
			F-Total volume	
			R-Total volume	
			F-Total net	
			R-Total net	
		Pulse 2 unit	**Hz**	Sel
			g/P	
			kg/P	
			t/P	
			lb/P	
			cm^3/P	
			l/P	
			m^3/P	
			gal/P	
			kgal/P	
			Cuft/P	
			bbl/P	
			Impgal/P	
			klmpgal/P	
			I(N)/P	
			m^3(N)/P	
			SI/P	
			Scuft/P *)	
			Sm^3/P *)	
		Pulse 2 rate		R/W

Basic Setup		SO 2 function	**No Function**	Sel
			Flow direction	
			Total limit switch	
			Mass flow alm 1	
			Mass flow alm 2	
			Mass flow alm 1+2	
			Vol flow alm 1	
			Vol flow alm 2	
			Vol flow alm 1+2	
			Density alm 1	
			Density alm 2	
			Density alm 1+2	
			Temp alm 1	
			Temp alm 2	
			Temp alm 1+2	
			Concentr. meas alm 1	
			Concentr. meas alm 2	
			Concentr. meas alm 1+2	
			Net flow alm 1	
			Net flow alm 2	
			Net flow alm 1+2	
			Slug Alarm	
			Empty alarm	
			Corrosion Alarm	
			All alarms	
			All errors	
			All alarms & errors	
	SI function	**No function**		Sel
		Autozero		
		Reset flex totals		
		Reset mass totals		
		Reset volume totals		
		Reset net totals		
		Reset all totals		
		0% signal lock		
	Totalizer	Total flex select	**Mass**	Sel
			Volume	
			Net	

Basic Setup		Total flex unit	g	Sel
			kg	
			t	
			lb	
			cm^3	
			l	
			m^3	
			gal	
			kgal	
			Cuft	
			bbl	
			Impgal	
			KImpgal	
			l(N)	
			m^3(N)	
			Sl	
			Scuft	
			MMscuft	
			Sm^3	
		Total mass unit	g	Sel
			kg	
			t	
			lb	
		Total volume unit	cm^3	Sel
			l	
			m^3	
			gal	
			kgal	
			Cuft	
			bbl	
			Impgal	
			KImpgal	
			l(N) *)	
			m^3(N) *)	
			Sl *)	
			Scuft *)	
			MMscuft *)	
			Sm^3 *)	

Basic Setup		Total net unit	g	
			kg	
			t	
			lb	
			cm^3	
			l	
			m^3	
			gal	
			kgal	
			Cuft	
			bbl	
			Impgal	
			KImpgal	
		Total switch select	**Flex total**	Sel
			Mass total	
			Volume total	
			Net total	
Detailed Setup	Display config	Disp select 1	**Mass flow**	Sel
			Volume flow	
			Density	
			Temperature	
			Concentration meas	
			Net flow	
			F-Total flex	
			R-Total flex	
			D-Total flex	
			F-Total mass	
			R-Total mass	
			D-Total mass	
			F-Total volume	
			R-Total volume	
			D-Total volume	
			F-Total net	
			R-Total net	
			D-Total net	
			F-Total energy	
			Velocity	
			Drive gain	

Detailed Setup		Disp select 2	Mass flow	Sel
			Volume flow	
			Density	
			Temperature	
			Concentration meas	
			Net flow	
			F-Total flex	
			R-Total flex	
			D-Total flex	
			F-Total mass	
			R-Total mass	
			D-Total mass	
			F-Total volume	
			R-Total volume	
			D-Total volume	
			F-Total net	
			R-Total net	
			D-Total net	
			F-Total energy	
			Velocity	
			Drive gain	
			None	
		Disp select 3	Mass flow	Sel
			Volume flow	
			Density	
			Temperature	
			Concentration meas	
			Net flow	
			F-Total flex	
			R-Total flex	
			D-Total flex	
			F-Total mass	
			R-Total mass	
			D-Total mass	
			F-Total volume	
			R-Total volume	
			D-Total volume	
			F-Total net	
			R-Total net	
			D-Total net	
			F-Total energy	
			Velocity	
			Drive gain	
			None	

Detailed Setup		Disp select 4	Mass flow	Sel
			Volume flow	
			Density	
			Temperature	
			Concentration meas	
			Net flow	
			F-Total flex	
			R-Total flex	
			D-Total flex	
			F-Total mass	
			R-Total mass	
			D-Total mass	
			F-Total volume	
			R-Total volume	
			D-Total volume	
			F-Total net	
			R-Total net	
			D-Total net	
			F-Total energy	
			Velocity	
			Drive gain	
			None	
		Display contrast	-5	Sel
			-4	
			-3	
			-2	
			-1	
			0	
			+1	
			+2	
			+3	
			+4	
			+5	
		Disp period	0.5s	Sel
			1.0s	
			2.0s	
		Language	**English**	Sel
			German	
			French	
			Russian	

Detailed Setup	Sensor model	RCCS30LR *)		Sel
		RCCS30 *)		
		RCCS31 *)		
		RCCS32 *)		
		RCCS33 *)		
		RCCS34		
		RCCS36		
		RCCS38		
		RCCS39		
		RCCS39/IR *)		
		RCCS39/XR *)		
	Sensor constants *)	Mass flow	SK20	R/W
			SKT	R/W
			SKTK	R/W
			RV	R/W
			Qnom	R
			SKP	R/W
			SKPT	R/W
		Density	KD	R/W
			fl20	R/W
			FTC1	R/W
			FTCK	R/W
			FPC	R/W
			FPTC	R/W
			FQC1	R/W
			FQC2	R/W
	Config fld variables	Flow direction *)	**Forward**	Sel
			Reverse	

Detailed Setup		Mass flow	Mass flow unit	g/s	Sel
				g/min	
				g/h	
				kg/s	
				kg/min	
				kg/h	
				kg/d	
				t/min	
				t/h	
				t/d	
				lb/s	
				lb/min	
				lb/h	
				lb/d	
			Mass flow format	xxxxxxx	Sel
				xxxxx.X	
				xxxx.XX	
				xxx.XXX	
				xx.XXXX	
				x.XXXXX	
			Mass flow LRV		R/W
			Mass flow URV		R/W
			Mass flow damping		R/W
			Mass flow lowcut *)		R/W
			Mass flow alm 1 sel	**No function**	Sel
				More than	
				Less than	
			Mass flow alm 1 crit		R/W
			Mass flow alm 2 sel	**No function**	Sel
				More than	
				Less than	
			Mass flow alm 2 crit		R/W
			Mass flow fix val sel	**Inhibit**	Sel
				Enable *)	
			Mass flow fixed val *)		R/W

Detailed Setup		Volume flow	Vol flow unit	cm^3/s	Sel
				cm^3/min	
				cm^3/h	
				l/s	
				l/min	
				l/h	
				l/d	
				m^3/s	
				m^3/min	
				m^3/h	
				m^3/d	
				gal/s	
				gal/min	
				gal/h	
				gal/d	
				Cuft/s	
				Cuft/min	
				Cuft/h	
				Cuft/d	
				bbl/s	
				bbl/min	
				bbl/h	
				bbl/d	
				Impgal/s	
				Impgal/min	
				Impgal/h	
				Impgal/d	
				l(N)/s *)	
				l(N)/min *)	
				l(N)/h *)	
				l(N)/d *)	
				m^3(N)/s *)	
				m^3(N)/min *)	
				m^3(N)/h *)	
				m^3(N)/d *)	
				Sl/s *)	
				Sl/min *)	
				Sl/h *)	
				Sl/d *)	
				Scuft/s *)	
				Scuft/min *)	
				Scuft/h *)	
				Scuft/d *)	
				Sm^3/s *)	
				Sm^3/min *)	
				Sm^3/h *)	
				Sm^3/d *)	

Detailed Setup			Vol flow format	xxxxxxx	Sel
				xxxxx.X	
				xxxx.XX	
				xxx.XXX	
				xx.XXXX	
				x.XXXXX	
			Vol flow LRV		R/W
			Vol flow URV		R/W
			Vol flow damping		R/W
			Vol flow lowcut *)		R/W
			Vol flow alm 1 sel	**No function**	Sel
				More than	
				Less than	
			Vol flow alm 1 crit		R/W
			Vol flow alm 2 sel	**No function**	Sel
				More than	
				Less than	
			Vol flow alm 2 crit		R/W
		Density	Density unit	g/ml	Sel
				kg/l	
				kg/m³	
				lb/gal	
				lb/Cuft	
				g/cm³	
				g/l	
				°Bé hv *)	
				°Bé lt *)	
				°API *)	
			Density format	xxxxxxx	Sel
				xxxxx.X	
				xxxx.XX	
				xxx.XXX	
				xx.XXXX	
				x.XXXXX	
			Density LRV		R/W
			Density URV		R/W
			Density damping		R/W

Detailed Setup			Density lowcut *)		R/W
			Density alm 1 sel	**No function**	Sel
				More than	
				Less than	
			Density alm 1 crit		R/W
			Density alm 2 sel	**No function**	Sel
				More than	
				Less than	
			Density alm 2 crit		R/W
			Ref. Density sel **)	**Inhibit**	Sel
				Fixed	
				Calculated	
			Reference density		R/W
			Reference density setup **)	Reference Temperature	R/W
				Temp. coeff. a	R/W
				Temp. coeff. b	R/W
			Density fix val sel ***)	Inhibit	Sel
				Enable *)	
			Density offset *)		R/W
			Pressure Unit	**bar**	Sel
				psi	
				MPa	
			Pressure		R/W
		Temperature	Temperature unit	**degC**	Sel
				degF	
				K	
			Temperature format	xxxxxxx	Sel
				xxxxx.X	
				xxxx.XX	
				xxx.XXX	
				xx.XXXX	
				x.XXXXX	
			Temperature LRV		R/W

Detailed Setup			Temperature URV		R/W
			Temperature damping		R/W
			Temp alm 1 sel	**No function**	Sel
				More than	
				Less than	
			Temp alm 1 crit		R/W
			Temp alm 2 sel	**No function**	Sel
				More than	
				Less than	
			Temp alm 2 crit		R/W
			Temp fix val select	**Inhibit**	Sel
				Enable *)	
			Temp fixed value *)		R/W
			Temp gain *)		R/W
		Velocity unit	**m/s**		Sel
			ft/s		
	Config Output/Input	Analog output 1	Analog 1 select *)	**Mass flow**	Sel
				Volume flow	
				Density	
				Temperature	
				Concentration meas	
				Net flow	
				None	
			Analog 1 alarm Out	<2.4 mA	Sel
				<3.6 mA	
				<4.0 mA	
				>21.0 mA	
				>21.6 mA	
				Hold	
				Measured value	
			Analog 1 low LMT		R/W
			Analog 1 high LMT		R/W

Detailed Setup		Analog output 2	Analog 2 select	Mass flow	Sel
				Volume flow	
				Density	
				Temperature	
				Concentration meas	
				Net flow	
				None	
			Analog 2 alarm Out	<2.4 mA	Sel
				<3.6 mA	
				<4.0 mA	
				>21.0 mA	
				>21.6 mA	
				Hold	
				Measured value	
			Analog 2 low LMT		R/W
			Analog 2 high LMT		R/W
		Pulse/Status out 1	Pulse/Stat 1 select	**Pulse**	Sel
				Status out *)	
				No function *)	
			Pulse 1 select	Mass flow	Sel
				Volume flow	
				Density	
				Temperature	
				Concentration meas	
				Net flow	
				None	
				F-Total mass	
				R-Total mass	
				F-Total volume	
				R-Total volume	
				F-Total net	
				R-Total net	

Detailed Setup			Pulse 1 unit	Hz	Sel
				g/P	
				kg/P *)	
				t/P *)	
				lb/P *)	
				cm³/P	
				l/P *)	
				m³/P *)	
				gal/P *)	
				kgal/P *)	
				Cuft/P *)	
				bbl/P *)	
				lmpgal/P *)	
				klmpgal/P *)	
				l(N)/P *)	
				m³(N)/P *)	
				Sl/P *)	
				Scuft/P *)	
				Sm³/P *)	
			Pulse 1 rate *)		R/W
			Pulse 1 active mode	**On Active**	Sel
				Off Active	
			Pulse 1 width	0.05ms	Sel
				0.1ms *)	
				0.5ms *)	
				1ms	
				5ms *)	
				10ms *)	
				50ms *)	
				100ms *)	
				50ms *)	
				1000ms *)	
			Pulse 1 at alarm	**0P/0Hz**	Sel
				Measured value	
				Hold	

Detailed Setup			SO 1 function *)	**No Function**	Sel
				Flow direction	
				Mass flow alm 1	
				Mass flow alm 2	
				Mass flow alm 1+2	
				Vol flow alm 1	
				Vol flow alm 2	
				Vol flow alm 1+2	
				Density alm 1	
				Density alm 2	
				Density alm 1+2	
				Temp alm 1	
				Temp alm 2	
				Temp alm 1+2	
				Concentr. meas alm 1	
				Concentr. meas alm 2	
				Concentr. meas alm 1+2	
				Net flow alm 1	
				Net flow alm 2	
				Net flow alm 1+2	
				Slug Alarm	
				Empty alarm	
				Corrosion Alarm	
				All alarms	
				All errors	
				All alarms & errors	
			SO1 active mode *)	**On Active**	Sel
				Off Active	
		Pulse/Status out 2	Pulse/Stat 2 select	Pulse	Sel
				Status out	
				No function	
			Pulse 2 select	Mass flow	Sel
				Volume flow	
				Density	
				Temperature	
				Concentration meas	
				Net flow	
				None	
				F-Total mass	
				R-Total mass	
				F-Total volume	
				R-Total volume	
				F-Total net	
				R-Total net	

Detailed Setup			Pulse 2 unit	**Hz**	Sel
				g/P	
				kg/P	
				t/P	
				lb/P	
				cm^3/P	
				l/P	
				m^3/P	
				gal/P	
				kgal/P	
				Cuft/P	
				bbl/P	
				lmpgal/P	
				klmpgal/P	
				I(N)/P *)	
				m^3(N)/P *)	
				SI/P *)	
				Scuft/P *)	
				Sm^3/P *)	
			Pulse 2 rate		R/W
			Pulse 2 active mode	**On Active**	Sel
				Off Active	
			Pulse 2 width	0.05ms	Sel
				0.1ms	
				0.5ms	
				1ms	
				5ms	
				10ms	
				50ms	
				100ms	
				50ms	
				1000ms	
			Pulse 2 at alarm	**0P/0Hz**	Sel
				Measured value	
				Hold	

Detailed Setup			SO2 function	**No Function**	Sel
				Flow direction	
				Total limit switch	
				Mass flow alm 1	
				Mass flow alm 2	
				Mass flow alm 1+2	
				Vol flow alm 1	
				Vol flow alm 2	
				Vol flow alm 1+2	
				Density alm 1	
				Density alm 2	
				Density alm 1+2	
				Temp alm 1	
				Temp alm 2	
				Temp alm 1+2	
				Concentr. meas alm 1	
				Concentr. meas alm 2	
				Concentr. meas alm 1+2	
				Net flow alm 1	
				Net flow alm 2	
				Net flow alm 1+2	
				Slug Alarm	
				Empty alarm	
				Corrosion Alarm	
				All alarms	
				All errors	
				All alarms & errors	
			SO2 active mode	**On Active**	Sel
				Off Active	
		Status input	SI function	**No function**	Sel
				Autozero	
				Reset flex totals	
				Reset mass totals	
				Reset volume totals	
				Reset net totals	
				Reset all totals	
				0% signal lock	
			SI active mode	**On Active**	Sel
				Off Active	

Detailed Setup		HART output	PV is	**Mass flow**	Sel
				Volume flow	
				Density	
				Temperature	
				Concentration meas	
				Net flow	
				None	
			SV is	Mass flow	Sel
				Volume flow	
				Density	
				Temperature	
				Concentration meas	
				Net flow	
				None	
				F-Total mass	
				R-Total mass	
				F-Total volume	
				R-Total volume	
				F-Total net	
				R-Total net	
				F-Total flex	
				R-Total flex	
				D-Total mass	
				D-Total volume	
				D-Total net	
				D-Total flex	
				F-Total energy	
				Velocity	
				Drive gain	
			TV is	Mass flow	Sel
				Volume flow	
				Density	
				Temperature	
				Concentration meas	
				Net flow	
				None	
				F-Total mass	
				R-Total mass	
				F-Total volume	
				R-Total volume	
				F-Total net	
				R-Total net	
				F-Total flex	
				R-Total flex	
				D-Total mass	
				D-Total volume	
				D-Total net	
				D-Total flex	
				F-Total energy	
				Velocity	
				Drive gain	

Detailed Setup			QV is	Mass flow	Sel
				Volume flow	
				Density	
				Temperature	
				Concentration meas	
				Net flow	
				None	
				F-Total mass	
				R-Total mass	
				F-Total volume	
				R-Total volume	
				F-Total net	
				R-Total net	
				F-Total flex	
				R-Total flex	
				D-Total mass	
				D-Total volume	
				D-Total net	
				D-Total flex	
				F-Total energy	
				Velocity	
				Drive gain	
	Totalizer	Total flex select	**Mass**		Sel
			Volume		
			Net		
		Total flex unit	g		Sel
			kg		
			t		
			lb		
			cm^3		
			l		
			m^3		
			gal		
			kgal		
			Cuft		
			bbl		
			Impgal		
			KImpgal		
			l(N) *)		
			m^3(N) *)		
			Sl *)		
			Scuft *)		
			MMscuft *)		
			Sm^3 *)		
		Total mass unit	g		Sel
			kg		
			t		
			lb		

Detailed Setup	Total volume unit	cm³			Sel
		l			
		m³			
		gal			
		kgal			
		Cuft			
		bbl			
		Impgal			
		kimpgal			
		l(N) *)			
		m³(N) *)			
		Sl *)			
		Scuft *)			
		MMscuft *)			
		Sm³ *)			
	Total net unit	g			
		kg			
		t			
		lb			
		cm³			
		l			
		m³			
		gal			
		kgal			
		Cuft			
		bbl			
		Impgal			
		kimpgal			
	Total unit energy	**MJ**			Sel
		Btu			
	Energy factor	Heat of combustion			R/W
		Heat of combustion unit	**MJ/kg**		Sel
			Btu/lb		
			MJ/m³(N) *)		
			Btu/Scuft *)		
	Total switch select	**Flex total**			Sel
		Mass total			
		Volume total			
		Net total			
	Total limit switch				R/W
	Total at alarm	**Hold**			Sel
		Continue total			
	Total reset cntrl	**Inhibit**			Sel
		Enable			

Detailed Setup		Total reset	Not Execute	
			Reset flex totals	Exe
			Reset mass totals	Exe
			Reset volume totals	Exe
			Reset net totals	Exe
			Reset all totals	Exe
	HART communication	Poll addr		R/W
		Num req pream		R/W
		Num resp pream		R/W
		Master reset		Exe
	Concentration setup	Reference Temperature		R/W
		Ref. density carrier		R/W
		Temp. coeff. a carrier		R/W
		Temp. coeff. b carrier		R/W
		Ref. density product		R/W
		Temp. coeff. a product		R/W
		Temp. coeff. b product		R/W
	Concentration meas	Concentr. meas unit	°Brix	Sel
			Wt-% sol	
			Vol% sol	
			Vol%	
			Wt-%	
		Concentr. meas format	xxxxxxx	Sel
			xxxxx.X	
			xxxx.XX	
			xxx.XXX	
			xx.XXXX	
			x.XXXXX	
		Concentr.meas LRV		R/W
		Concentr. meas URV		R/W
		Concentr. meas Damp		R/W
		Concentr. meas Lowcut		R/W

Detailed Setup		Conc meas alm 1 Sel	**No function**	Sel
			More than	
			Less than	
		Conc meas alm 1 Crit		R/W
		Conc meas alm 2 Sel	**No function**	Sel
			More than	
			Less than	
		Conc meas alm 2 crit		R/W
	Net flow	Net flow select	**Mass**	Sel
			Volume	
		Net flow unit	g/s	Sel
			g/min	
			g/h	
			kg/s	
			kg/min	
			kg/h	
			kg/d	
			t/min	
			t/h	
			t/d	
			lb/s	
			lb/min	
			lb/h	
			lb/d	
			cm^3/s	
			cm^3/min	
			cm^3/h	
			l/s	
			l/min	
			l/h	
			l/d	
			m^3/s	
			m^3/min	
			m^3/h	
			m^3/d	
			gal/s	
			gal/min	
			gal/h	
			gal/d	
			Cuft/s	
			Cuft/min	
			Cuft/h	
			Cuft/d	
			bbl/s	
			bbl/min	
			bbl/h	

Detailed Setup			bbl/d	
			Impgal/s	
			Impgal/min	
			Impgal/h	
			Impgal/d	
		Net flow format	xxxxxxx	Sel
			xxxxx.X	
			xxxx.XX	
			xxx.XXX	
			xx.XXXX	
			x.XXXXX	
		Net flow LRV		R/W
		Net flow URV		R/W
		Net flow damping		R/W
		Net flow lowcut		R/W
		Net flow Alm 1 Sel	**No function**	Sel
			More than	
			Less than	
		Net flow Alm 1 Crit		R/W
		Net flow Alm 2 Sel	**No function**	Sel
			More than	
			Less than	
		Net flow Alm 2 Crit		R/W
	Measuring range			R
	Slug detection	Slug alarm select	**Not apply**	Sel
			Apply *)	
		Drive gain *)		R
		Slug criteria *)		R/W
		Slug duration *)		R/W
		After slug *)	**Measured value** *)	Sel
			Holdv	
		Drive gain damping *)		

Detailed Setup	Empty pipe detect	Empty pipe alm sel	**Not apply**	Sel
			Apply	
		Empty pipe crit		R/W
		After empty pipe	**Massflow=Zero**	Sel
			Measured Value	
			Hold	
	Corrosion detect	Corrosion alm sel	**Not apply**	Sel
			Apply	
		Corrosion crit		R/W
		Corrosion damp		R/W
	Fluid max temp			R
	Device information	Distributor		R
		Tag		R/W
		Long Tag		R/W
		Descriptor		R/W
		Message		R/W
		Date		R/W
		Sensor model		R
		Sensor S/N		R
		Assembly number		R
		Serial no. converter		R
		Serial no. detector		R
		Device S/W	Device S/W version	R
			Device S/W date	R
		Device id		R
		Universal rev		R
		Fld dev rev		R
		Software rev		R
		Hardware rev		R

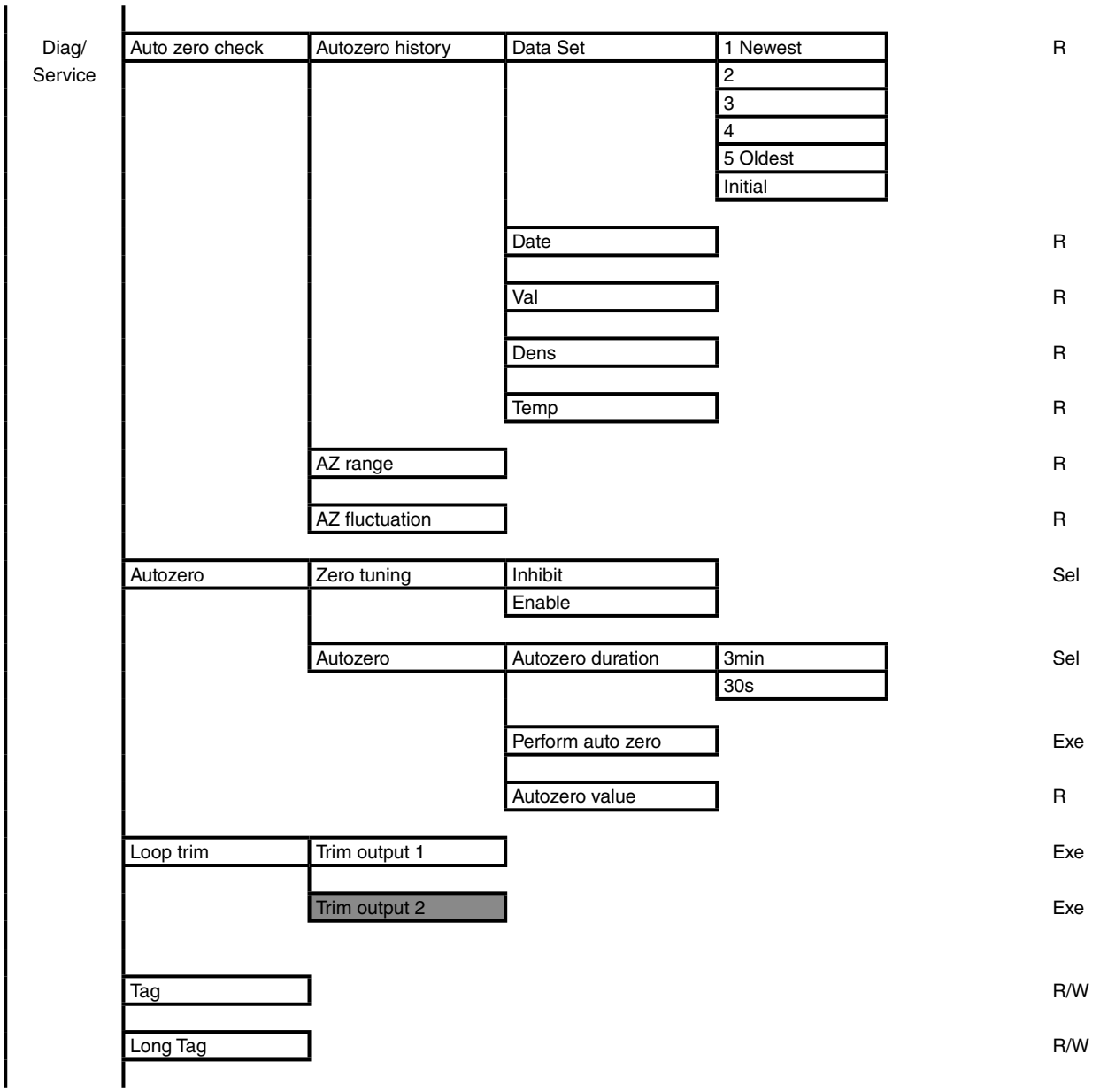
3.4 Parameter tree, HART menu

Online	Device setup	Set parameters for Rotamass (see below)
	PV	Display process value in engineering unit
	PV AO	Display analogue output in mA
	Review	Review parameters for Rotamass (see below)
	Service	Not open

Device setup

Language	English			Sel
	German			
	French			
	Russian			
Process variables	View fld dev vars	Mass flo		R
		Volume flo		R
		Dens		R
		Temp		R
		Conc meas		R
		Net flo		R
		F-Totl flex		R
		R-Totl flex		R
		D-Totl flex		R
		F-Totl mass		R
		R-Totl mass		R
		D-Totl mass		R
		F-Totl vol		R
		R-Totl vol		R
		D-Totl vol		R
		F-Totl net		R
		R-Totl net		R
		D-Totl net		R
		F-Totl energy		R
		Velocity		R
		Drive Gain		R
	View Outputs	Analog output 1	Analog 1 select	R
			PV	R
			PV AO	R
			% rnge	R
		Analog output 2	Analog 2 select	R
			SV	R
			SV AO	R
			% rnge	R
		Pulse/Status out 1	Pulse 1 select	R
			TV	R
			TV Freq	R
			SO 1 function *)	R
			SO 1 mode *)	R
			No function	R

		Pulse/Status out 2	Pulse 2 select		R
			QV		R
			QV Freq		R
			SO 2 function		R
			SO 2 mode		R
			No function		R
	View Input	Input function			R
	Totalizer	Total res cntrl	Inhibit		Sel
			Enable		
		Total reset	Not execute		Exe
			Reset flex totals		Exe
			Reset mass totals		Exe
			Reset volume totals		Exe
			Reset net totals		Exe
			Reset all totals		Exe
Diag/ Service	Self test/Status	Self test	LCD/Key Test		Exe
			Self Test		Exe
		Status	Event overview		R
			Error		R
			Alarm		R
			Warning		R
		Hist Overview ord	Hist Overview ord		R
			Clear History ord	Not execute	Sel
				Execute	
		Hist Overview abs	History Set	Abs	R
				Set 1	R
				:	
				Set 10	R
			History Set menu	History Set	R
				Hist overview	R
				H. error	R
				H. Alarm	R
				H. Warning	R
			Clear History abs		Exe
	Input/Output test	Analog Out 1			R/W
		Analog Out 2			R/W
		Pulse Out 1			R/W
		Status Out 1 *)			R/W
		Pulse Out 2			R/W
		Status Out 2			R/W
		Status Input			R



Basic Setup	Display config	Disp select 1	Mass flo	Sel
			Vol flo	
			Dens	
			Temp	
			Conc meas	
			Net flo	
			F-Totl flex	
			R-Totl flex	
			D-Totl flex	
			F-Totl mass	
			R-Totl mass	
			D-Totl mass	
			F-Totl vol	
			R-Totl vol	
			D-Totl vol	
			F-Totl net	
			R-Totl net	
			D-Totl net	
			F-Totl energy	
			Velocity	
			Drive Gain	
		Disp select 2	Mass flo	Sel
			Vol flo	
			Dens	
			Temp	
			Conc meas	
			Net flo	
			F-Totl flex	
			R-Totl flex	
			D-Totl flex	
			F-Totl mass	
			R-Totl mass	
			D-Totl mass	
			F-Totl vol	
			R-Totl vol	
			D-Totl vol	
			F-Totl net	
			R-Totl net	
			D-Totl net	
			F-Totl energy	
			Velocity	
			Drive Gain	
			None	

Basic Setup		Disp select 3	Mass flo	Sel
			Vol flo	
			Dens	
			Temp	
			Conc meas	
			Net flo	
			F-Totl flex	
			R-Totl flex	
			D-Totl flex	
			F-Totl mass	
			R-Totl mass	
			D-Totl mass	
			F-Totl vol	
			R-Totl vol	
			D-Totl vol	
			F-Totl net	
			R-Totl net	
			D-Totl net	
			F-Totl energy	
			Velocity	
			Drive Gain	
			None	
		Disp select 4	Mass flo	Sel
			Vol flo	
			Dens	
			Temp	
			Conc meas	
			Net flo	
			F-Totl flex	
			R-Totl flex	
			D-Totl flex	
			F-Totl mass	
			R-Totl mass	
			D-Totl mass	
			F-Totl vol	
			R-Totl vol	
			D-Totl vol	
			F-Totl net	
			R-Totl net	
			D-Totl net	
			F-Totl energy	
			Velocity	
			Drive Gain	
			None	
	Display contrast	-5		Sel
		-4		
		-3		
		-2		
		-1		
		0		
		+1		
		+2		
		+3		
		+4		
		+5		

Basic Setup	Mass flo	Mass flo unit	g/s	Sel
			g/min	
			g/h	
			kg/s	
			kg/min	
			kg/h	
			kg/d	
			t/min	
			t/h	
			t/d	
			lb/s	
			lb/min	
			lb/h	
			lb/d	
		Mass flo LRV		R/W
		Mass flo URV		R/W
		Mass flo Damping		R/W
	Dens	Dens unit	g/mL	Sel
			kg/L	
			kg/m3	
			lb/gal	
			lb/Cuft	
			g/cm3	
			g/L	
			°Bé hv *)	
			°Bé lt *)	
			°API *)	
		Density LRV		R/W
		Density URV		R/W
		Density damping		R/W
	Temp	Temp unit	degC	Sel
			degF	
			K	
		Temp LRV		R/W
		Temp URV		R/W
		Temp Damping		R/W
	Analog 1 select *)	Mass flo		Sel
		Vol flo		
		Density		
		Temperature		
		Conc meas		
		Net flo		
		None		

Basic Setup	Analog 2 select	Mass flo			Sel
		Vol flo			
		Density			
		Temperature			
		Conc meas			
		Net flo			
		None			
	Pulse/Status out 1	Pulse/Stat 1 select *)	Pulse		Sel
			Status out *)		
			No function		
		Pulse out 1	Pulse 1 select	Mass flo	Sel
				Vol flo	
				Dens	
				Temp	
				Conc meas	
				Net flo	
				None	
				F-Totl mass	
				R-Totl mass	
				F-Totl vol	
				R-Totl vol	
				F-Totl net *)	
				R-Totl net *)	
			TV Pls unit	Hz	Sel
				g/P	
				kg/p *)	
				t/P *)	
				lb/P *)	
				cm3/P	
				L/P *)	
				m3/P *)	
				gal/P *)	
				kgal/P *)	
				Cuft/P *)	
				bbl/P *)	
				Impgal/P *)	
				klmpgal/P *)	
				L(N)/P *)	
				m3(N)/P *)	
				L(Std)/P *)	
				StdCuft/P *)	
				m3(Std)/P *)	
			TV Pls rate		R/W

Basic Setup		Status out 1 *)	SO 1 function	No Function	Sel
				Flow direction	
				Total Switch	
				Mass flo alm 1	
				Mass flo alm 2	
				Mass flo alm 1+2	
				Vol flo alm 1	
				Vol flo alm 2	
				Vol flo alm 1+2	
				Dens alm 1	
				Dens alm 2	
				Dens alm 1+2	
				Temp alm 1	
				Temp alm 2	
				Temp alm 1+2	
				Conc alm 1	
				Conc alm 2	
				Conc alm 1+2	
				Net flo alm 1	
				Net flo alm 2	
				Net flo alm 1+2	
				Slug Alarm	
				Empty Alarm	
				Corrosion Alarm	
				All Alarms	
				All Errors	
				All Alarms & Errors	
	Pulse/Status out 2	Pulse/Stat 2 select	Pulse		Sel
			Status out		
			No function		
		Pulse out 2	Pulse 2 select	Mass flo	Sel
				Vol flo	
				Dens	
				Temp	
				Conc meas	
				Net flo	
				None	
				F-Totl mass	
				R-Totl mass	
				F-Totl vol	
				R-Totl vol	
				F-Totl net	
				R-Totl net	

Basic Setup			QV Pls unit	Hz	Sel
				g/P	
				kg/p	
				t/P	
				lb/P	
				cm3/P	
				L/P	
				m3/P	
				gal/P	
				kgal/P	
				Cuft/P	
				bbl/P	
				Impgal/P	
				klmpgal/P	
				L(N)/P *)	
				m3(N)/P *)	
				L(Std)/P *)	
				StdCuft/P *)	
				m3(Std)/P *)	
			QV Pls rate		R/W
		Status out 2	SO 2 function	No Function	Sel
				Flow direction	
				Total Switch	
				Mass flo alm 1	
				Mass flo alm 2	
				Mass flo alm 1+2	
				Vol flo alm 1	
				Vol flo alm 2	
				Vol flo alm 1+2	
				Dens alm 1	
				Dens alm 2	
				Dens alm 1+2	
				Temp alm 1	
				Temp alm 2	
				Temp alm 1+2	
				Conc alm 1	
				Conc alm 2	
				Conc alm 1+2	
				Net flo alm 1	
				Net flo alm 2	
				Net flo alm 1+2	
				Slug Alarm	
				Empty Alarm	
				Corrosion Alarm	
				All Alarms	
				All Errors	
				All Alarms & Errors	

Basic Setup	Input function	No function		Sel
		Autozero		
		Reset flex totals		
		Reset mass totals		
		Reset volume totals		
		Reset net totals		
		Reset all totals		
		0% Signal lock		
	Totalizer	Total flex select	Mass	Sel
			Volume	
			Net	
		F-Totl flex Unit	g	
			kg	
			t	
			lb	
			cm3	
			L	
			m3	
			gal	
			kgal	
			Cuft	
			bbl	
			Impgal	
			klmpgal	
			L(N) *)	
			m3(N) *)	
			L(Std) *)	
			StdCuft *)	
			MMscuft *)	
			m3(Std) *)	
		F-Totl mass Unit	g	Sel
			kg	
			t	
			lb	
		F-Totl vol Unit	cm3	Sel
			L	
			m3	
			gal	
			kgal	
			Cuft	
			bbl	
			Impgal	
			klmpgal	
			L(N) *)	
			m3(N) *)	
			L(Std) *)	
			StdCuft *)	
			MMscuft *)	
			m3(Std) *)	

Basic Setup		F-Totl net Unit	g	Sel
			kg	
			t	
			lb	
			cm3	
			L	
			m3	
			gal	
			kgal	
			Cuft	
			bbl	
			Impgal	
			klmpgal	
			L(N) *)	
			m3(N) *)	
			L(Std) *)	
			StdCuft *)	
			MMscuft *)	
			m3(Std) *)	
		Total switch select	Flex total	Sel
			Mass total	
			Volume total	
			Net total	

Detailed Setup	Display config	Disp Select 1	Mass flo	Sel
			Vol flo	
			Dens	
			Temp	
			Conc meas	
			Net flo	
			F-Totl flex	
			R-Totl flex	
			D-Totl flex	
			F-Totl mass	
			R-Totl mass	
			D-Totl mass	
			F-Totl vol	
			R-Totl vol	
			D-Totl vol	
			F-Totl net	
			R-Totl net	
			D-Totl net	
			F-Totl energy	
			Velocity	
			Drive Gain	

Detailed Setup		Disp Select 2	Mass flo	Sel
			Vol flo	
			Dens	
			Temp	
			Conc meas	
			Net flo	
			F-Totl flex	
			R-Totl flex	
			D-Totl flex	
			F-Totl mass	
			R-Totl mass	
			D-Totl mass	
			F-Totl vol	
			R-Totl vol	
			D-Totl vol	
			F-Totl net	
			R-Totl net	
			D-Totl net	
			F-Totl energy	
			Velocity	
			Drive Gain	
			None	
		Disp Select 3	Mass flo	Sel
			Vol flo	
			Dens	
			Temp	
			Conc meas	
			Net flo	
			F-Totl flex	
			R-Totl flex	
			D-Totl flex	
			F-Totl mass	
			R-Totl mass	
			D-Totl mass	
			F-Totl vol	
			R-Totl vol	
			D-Totl vol	
			F-Totl net	
			R-Totl net	
			D-Totl net	
			F-Totl energy	
			Velocity	
			Drive Gain	
			None	

Detailed Setup		Disp Select 4	Mass flo	Sel
			Vol flo	
			Dens	
			Temp	
			Conc meas	
			Net flo	
			F-Totl flex	
			R-Totl flex	
			D-Totl flex	
			F-Totl mass	
			R-Totl mass	
			D-Totl mass	
			F-Totl vol	
			R-Totl vol	
			D-Totl vol	
			F-Totl net	
			R-Totl net	
			D-Totl net	
			F-Totl energy	
			Velocity	
			Drive Gain	
			None	
		Display contrast	-5	R/W
			-4	
			-3	
			-2	
			-1	
			0	
			+1	
			+2	
			+3	
			+4	
			+5	
		Display period	0.5s	Sel
			1.0s	
			2.0s	
		Language	English	Sel
			German	
			French	
			Russian	
	Sensor model	RCCS30LR *)		Sel
		RCCS30 *)		
		RCCS31 *)		
		RCCS32 *)		
		RCCS33 *)		
		RCCS34		
		RCCS36		
		RCCS38		
		RCCS39		
		RCCS39/IR *)		
		RCCS39/XR *)		

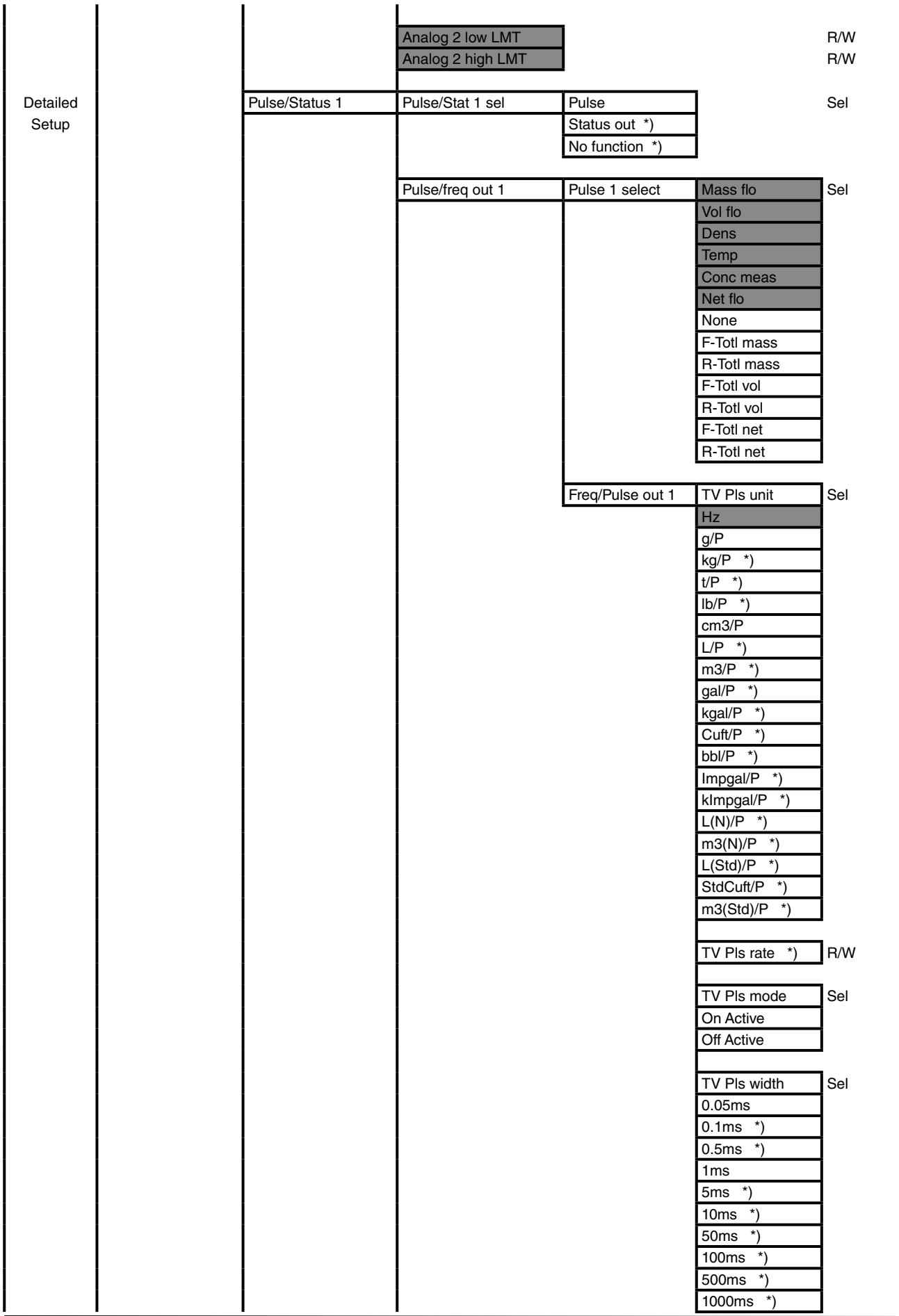
Detailed Setup	Sensor constants *)	Mass flo	SK20		R/W
			SKT		R/W
			SKTK		R/W
			RV		R/W
			Qnom		R
			SKP		R/W
			SKPT		R/W
		Density	KD		R/W
			FI20		R/W
			FTC1		R/W
			FTCK		R/W
			FPC		R/W
			FPTC		R/W
			FQC1		R/W
			FQC2		R/W
	Config fld var	Flow direction *)	Forward		Sel
			Reverse		
		Mass flo	Mass flo unit	g/s	Sel
				g/min	
				g/h	
				kg/s	
				kg/min	
				kg/h	
				kg/d	
				t/min	
				t/h	
				td	
				lb/s	
				lb/min	
				lb/h	
				lb/d	
			Mass flo format	xxxxxxx	Sel
				xxxxx.X	
				xxxx.XX	
				xxx.XXX	
				xx.XXXX	
				x.XXXXX	
			Mass flo LRV		R/W
			Mass flo URV		R/W

Detailed Setup			Mass flo damping		R/W
			Mass flo lowcut *)		R/W
			Mass flo alm 1 sel	No function	Sel
				More than	
				Less than	
			Mass flo alm 1 crit		R/W
			Mass flow alm 2 sel	No function	Sel
				More than	
				Less than	
			Mass flo alm 2 crit		R/W
			Mass flo fix sel	Inhibit	Sel
				Enable *)	
			Mass flo fix menu *)	Mass flo fixed val	R/W
		Vol flo	Vol flo Unit	cm3/s	Sel
				cm3/min	
				cm3/h	
				L/s	
				L/min	
				L/h	
				L/d	
				m3/s	
				m3/min	
				m3/h	
				m3/d	
				gal/s	
				gal/min	
				gal/h	
				gal/d	
				Cuft/s	
				Cuft/min	
				Cuft/h	
				Cuft/d	
				bbl/s	
				bbl/min	
				bbl/h	
				bbl/d	
				Impgal/s	
				Impgal/min	
				Impgal/h	
				Impgal/d	
				L(N)/s *)	
				L(N)/min *)	
				L(N)/h *)	
				L(N)/d *)	
				m3(N)/s *)	
				m3(N)/min *)	
				m3(N)/h *)	
				m3(N)/d *)	

Detailed Setup				L(Std)/s *)		
				L(Std)/min *)		
				L(Std)/h *)		
				L(Std)/d *)		
				StdCuft/s *)		
				StdCuft/min *)		
				StdCuft/h *)		
				StdCuft/d *)		
				m3(Std)/s *)		
				m3(Std)/min *)		
				m3(Std)/h *)		
				m3(Std)/d *)		
			Vol flo Format	xxxxxxx		Sel
				xxxxx.X		
				xxxx.XX		
				xxx.XXX		
				xx.XXXX		
				x.XXXXX		
			Vol flo LRV			R/W
			Vol flo URV			R/W
			Vol flo damping			R/W
			Vol flo Lowcut *)			R/W
			Vol flo alm 1 sel	No function		Sel
				More than		
				Less than		
			Vol flo alm 1 crit			R/W
			Vol flow alm 2 sel	No function		Sel
				More than		
				Less than		
			Vol flo alm 2 crit			R/W
		Dens	Dens Unit	g/mL		Sel
				kg/L		
				kg/m3		
				lb/gal		
				lb/Cuft		
				g/cm3		
				g/L		
				°Bé hv		
				°Bé lt		
				°API		
			Dens Format	xxxxxxx		Sel
				xxxxx.X		
				xxxx.XX		
				xxx.XXX		
				xx.XXXX		
				x.XXXXX		

Detailed Setup			Dens LRV		R/W
			Dens URV		R/W
			Dens damping		R/W
			Dens lowcut *)		R/W
			Dens alm 1 sel	No function	Sel
				More than	
				Less than	
			Dens alm 1 crit		R/W
			Dens alm 2 sel	No function	Sel
				More than	
				Less than	
			Dens alm 2 crit		R/W
			Ref. Density sel *) **)	Inhibit	Sel
				Fixed	
				Calculated	
			Fixed ref dens menu *) **)	Reference density	R/W
			Ref density setup *) **)	Ref. temperature	R/W
				Temp. coeff a	R/W
				Temp. coeff b	R/W
			Dens fix val sel ***)	Inhibit	Sel
				Enable *)	
			Dens fix menu ***)	Reference density	R/W
			Density offset		R/W
			Pressure Unit	bar	Sel
				psi	
				MPa	
			Pressure		R/W
		Temp	Temp Unit	degC	Sel
				degF	
				K	
			Temp Format	xxxxxxx	Sel
				xxxxx.X	
				xxxx.XX	
				xxx.XXX	
				xx.XXXX	
				x.XXXXX	
			Temp LRV		R/W

Detailed Setup			Temp URV		R/W
			Temp damping		R/W
			Temp alm 1 sel	No function	Sel
				More than	
				Less than	
			Temp alm 1 crit		R/W
			Temp alm 2 sel	No function	Sel
				More than	
				Less than	
			Temp alm 2 crit		R/W
			Temp fix val sel	Inhibit	Sel
				Enable	
			Temp fix menu	Temp fixed value	R/W
				Temp gain adjust	
		Velocity unit	m/s		Sel
			ft/s		
	Config Output/Input	Analog output 1	Analog 1 select *)	Mass flo	Sel
				Vol flo	
				Dens	
				Temp	
				Conc meas	
				Net flo	
				None	
			Analog 1 alarm Out	<2.4mA	Sel
				<3.6mA	
				<4.0mA	
				>21.0mA	
				>21.6mA	
				Hold	
				Measured value	
			Analog 1 low LMT		R/W
			Analog 1 high LMT		R/W
		Analog output 2	Analog 2 select	Mass flo	Sel
				Vol flo	
				Dens	
				Temp	
				Conc meas	
				Net flo	
				None	
			SV Analog 2 alarm Out	<2.4mA	Sel
				<3.6mA	
				<4.0mA	
				>21.0mA	
				>21.6mA	
				Hold	
				Measured value	



Detailed Setup				TV Pls alarm	Sel
				0 Hz / 0 Pulses	
				Hold	
				Measured value	
			Status out 1 *)	SO 1 function	No function Sel
					Flow direction
					Total switch
					Mass flo alm 1
					Mass flo alm 2
					Mass flo alm 1+2
					Vol flo alm 1
					Vol flo alm 2
					Vol flo alm 1+2
					Dens alm 1
					Dens alm 2
					Dens alm 1+2
					Temp alm 1
					Temp alm 2
					Temp alm 1+2
					Conc alm 1
					Conc alm 2
					Conc alm 1+2
					Net flo alm 1
					Net flo alm 2
					Net flo alm 1+2
					Slug Alarm
					Empty Alarm
					Corrosion Alarm
					All alarms
					All errors
					All alarms & errors
				SO 1 active mode	On Active Sel
					Off Active
		Pulse/Status 2	Pulse/Stat 2 sel	Pulse	Sel
				Status out	
				No function	
			Pulse/freq out 2	Pulse 2 select	Mass flo Sel
					Vol flo
					Dens
					Temp
					Conc meas
					Net flo
					None
					F-Totl mass
					R-Totl mass
					F-Totl vol
					R-Totl vol
					F-Totl net
					R-Totl net

Detailed Setup				Freq/Pulse out 2	QV Pls unit	Sel
					Hz	
					g/P	
					kg/P	
					t/P	
					lb/P	
					cm3/P	
					L/P	
					m3/P	
					gal/P	
					kgal/P	
					Cuft/P	
					bbl/P	
					Impgal/P	
					kImpgal/P	
					L(N)/P	
					m3(N)/P	
					L(Std)/P	
					StdCuft/P	
					m3(Std)/P	
					QV Pls rate	R/W
					QV Pls mode	Sel
					On Active	
					Off Active	
					QV Pls width	Sel
					0.05ms	
					0.1ms	
					0.5ms	
					1ms	
					5ms	
					10ms	
					50ms	
					100ms	
					500ms	
					1000ms	
					QV Pls alarm	Sel
					0 Hz / 0 Pulses	
					Hold	
					Measured value	

Detailed Setup			Status out 2	SO 2 function	No function	Sel
					Flow direction	
					Total switch	
					Mass flo alm 1	
					Mass flo alm 2	
					Mass flo alm 1+2	
					Vol flo alm 1	
					Vol flo alm 2	
					Vol flo alm 1+2	
					Dens alm 1	
					Dens alm 2	
					Dens alm 1+2	
					Temp alm 1	
					Temp alm 2	
					Temp alm 1+2	
					Conc alm 1	
					Conc alm 2	
					Conc alm 1+2	
					Net flo alm 1	
					Net flo alm 2	
					Net flo alm 1+2	
					Slug alarm	
					Empty alarm	
					Corrosion alarm	
					All alarms	
					All errors	
					All alarms & errors	
				SO 2 active mode	On Active	Sel
					Off Active	
		Status input	Input function	No Function		Sel
				Autozero		
				Reset flex totals		
				Reset mass totals		
				Reset volume totals		
				Reset net totals		
				Reset all totals		
				0% signal lock		
			SI active mode	On Active		Sel
				Off Active		

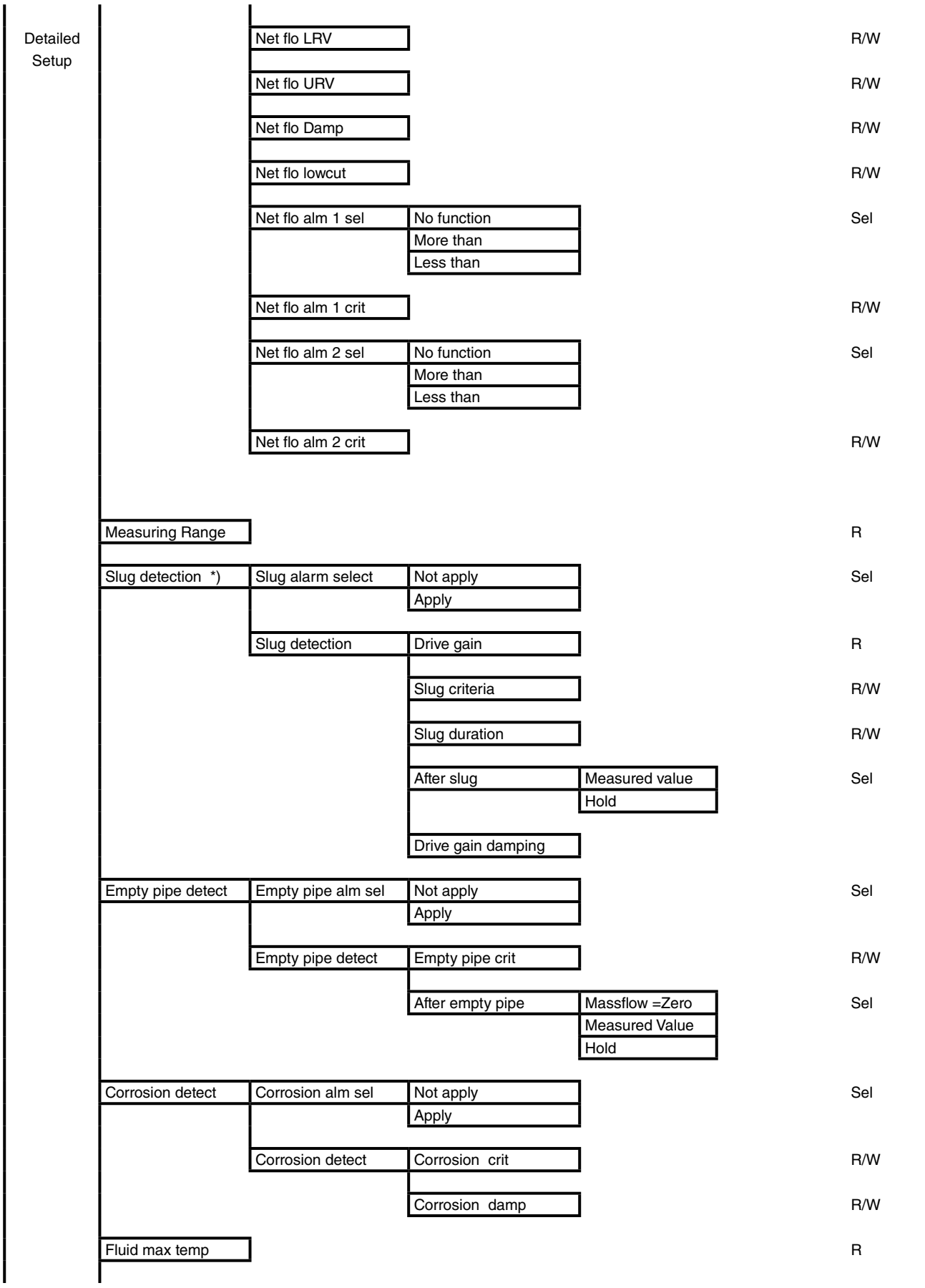
Detailed Setup	HART Output	PV is	Mass flo
			Vol flo
			Dens
			Temp
			Conc meas
			Net flo
			None
		SV is	Mass flo
			Vol flo
			Dens
			Temp
			Conc meas
			Net flo
			None
			F-Totl mass
			R-Totl mass
			F-Totl vol
			R-Totl vol
			F-Totl net
			R-Totl net
			F-Totl flex
			R-Totl flex
			D-Totl mass
			D-Totl vol
			D-Totl net
			D-Totl flex
			F-Totl energy
			Velocity
			Drive Gain
		TV is	Mass flo
			Vol flo
			Dens
			Temp
			Conc meas
			Net flo
			None
			F-Totl mass
			R-Totl mass
			F-Totl vol
			R-Totl vol
			F-Totl net
			R-Totl net
			F-Totl flex
			R-Totl flex
			D-Totl mass
			D-Totl vol
			D-Totl net
			D-Totl flex
			F-Totl energy
			Velocity
			Drive Gain

Detailed Setup			QV is	Mass flo	
				Vol flo	
				Dens	
				Temp	
				Conc meas	
				Net flo	
				None	
				F-Totl mass	
				R-Totl mass	
				F-Totl vol	
				R-Totl vol	
				F-Totl net	
				R-Totl net	
				F-Totl flex	
				R-Totl flex	
				D-Totl mass	
				D-Totl vol	
				D-Totl net	
				D-Totl flex	
				F-Totl energy	
				Velocity	
				Drive Gain	
	Totalizer	Total flex select	Mass		Sel
			Volume		
			Net		
		F-Totl flex Unit	g		
			kg		
			t		
			lb		
			cm3		
			L		
			m3		
			gal		
			kgal		
			Cuft		
			bbl		
			Impgal		
			klmpgal		
			L(N) *)		
			m3(N) *)		
			L(Std) *)		
			StdCuft *)		
			MMscuft *)		
			m3(Std) *)		
		F-Totl mass Unit	g		
			kg		
			t		
			lb		

Detailed Setup	F-Totl vol Unit	cm3			Sel
		L			
		m3			
		gal			
		kgal			
		Cuft			
		bbl			
		Impgal			
		klmpgal			
		L(N) *)			
		m3(N) *)			
		L(Std) *)			
		StdCuft *)			
		MMscuftv			
		m3(Std)v			
	F-Totl net Unit	g			Sel
		kg			
		t			
		lb			
		cm3			
		L			
		m3			
		gal			
		kgal			
		Cuft			
		bbl			
		Impgal			
		klmpgal			
		L(Std) *)			
		StdCuft *)			
		MMscuft *)			
		m3(Std) *)			
	F-Totl energy Unit	MJ			Sel
		Btu			
	Energy factor	Heat of combust unit	MJ/kg		Sel
			Btu/lb		
			MJ/Nm3 *)		
			Btu/Scuft *)		
		Heat of combustion			R/W
	Total switch select	Flex			Sel
		Mass			
		Volume			
		Net			
	Total limit switch				R/W
	Total at alarm	Hold			Sel
		continue			
	Total res cntrl	Inhibit			Sel
		Enable			

Detailed Setup		Total reset	Not execute	Exe
			Reset flex total	Exe
			Reset mass total	Exe
			Reset volume total	Exe
			Reset net total	Exe
			Reset all totals	Exe
	HART communication	Poll addr		R/W
		Num req pream		R/W
		Num resp preams		R/W
		Master reset		Exe
	Conc meas setup	Ref. temperature		R/W
		Ref. dens. carrier		R/W
		Coeff. a carrier		R/W
		Coeff b carrier		R/W
		Ref. dens. product		R/W
		Coeff. a product		R/W
		Coeff. b product		R/W
	Conc meas	Conc meas unit	degBrix	Sel
			% sol-wt	
			% sol-vol	
			Wt-%	
			Vol-%	
		Conc meas Format	xxxxxxx	Sel
			xxxxx.X	
			xxxx.XX	
			xxx.XXX	
			xx.XXXX	
			x.XXXXX	
		Conc meas LRV		R/W
		Conc meas URV		R/W
		Conc meas Damp		R/W
		Conc meas Lowcut		R/W
		Conc meas alm 1 sel	No function	Sel
			More than	
			Less than	
		Conc meas alm 1 crit		R/W

Detailed Setup		Conc meas alm 2 sel	No function	Sel
			More than	
			Less than	
		Conc meas alm 2 crit		R/W
	Net flo	Net flow select	Mass	Sel
			Volume	
			Not applicable	R
		Net flo Unit	g/s	Sel
			g/min	
			g/h	
			kg/s	
			kg/min	
			kg/h	
			kg/d	
			t/min	
			t/h	
			t/d	
			lb/s	
			lb/min	
			lb/h	
			lb/d	
			cm3/s	
			cm3/min	
			cm3/h	
			L/s	
			L/min	
			L/h	
			L/d	
			m3/s	
			m3/min	
			m3/h	
			m3/d	
			gal/s	
			gal/min	
			gal/h	
			gal/d	
			Cuft/s	
			Cuft/min	
			Cuft/h	
			Cuft/d	
			bbl/s	
			bbl/min	
			bbl/h	
			bbl/d	
			Impgal/s	
			Impgal/min	
			Impgal/h	
			Impgal/d	
		Net flo Format	xxxxxxx	Sel
			xxxxx.X	
			xxxx.XX	
			xxx.XXX	
			xx.XXXX	
			x.XXXXX	



Detailed Setup	Device information	Tag		R/W
		Long Tag		R/W
		Descriptor		R/W
		Message		R/W
		Date		R/W
		Sensor model		R
		Sensor S/N		R
		Final asmbly num		R
		S/N Converter		R
		S/N Detector		R
		Revision #‘s	Universal rev	R
			Fld dev rev	R
			Software rev	R
			Hardware rev	R
		Device S/W	Device S/W version	R
			Device S/W date	R
Review Device info	Distributor			R
	Sensor model			R
	Sensor S/N			R
	Final asmbly num			R
	Tag			R
	Long Tag			R
	Describtor			R
	Message			R
	Date			R
	Dev id			R
	Universal rev			R
	Fld dev rev			R
	Software rev			R
	Hardware rev			R
	Device S/W version			R
	Device S/W date			R
	S/N Converter			R
	S/N Detector			R

Review Sensor	SK20 *)	R
	SKT *)	R
	SKTKv	R
	RV *)	R
	Qnom *)	R
	SKP *)	R
	SKPT *)	R
	KD *)	R
	fl20 *)	R
	FTC1 *)	R
	FTCK *)	R
	FPC *)	R
	FPTC *)	R
	FQC1 *)	R
	FQC2 *)	R
	Autozero value	R
Rev Fld Dev vars 1	Flow direction *)	R
	Mass flo unit	R
	Mass flo LRV	R
	Mass flo URV	R
	Mass flo damp	R
	Mass flo lowcut *)	R
	Mass flo alm 1 sel	R
	Mass flo alm 1 crit	R
	Mass flo alm 2 sel	R
	Mass flo alm 2 crit	R
	Mass flo fixed value *)	R
	Vol flo unit	R
	Vol flo LRV	R
	Vol flo URV	R
	Vol flo damp	R
	Vol flo lowcut *)	R
	Vol flo alm 1 sel	R
	Vol flo alm 1 crit	R
	Vol flo alm 2 sel	R
	Vol flo alm 2 crit	R
	Dens unit	R
	Dens LRV	R
	Dens URV	R
	Dens damp	R
	Dens lowcut *)	R
	Dens alm 1 sel	R
	Dens alm 1 crit	R
	Dens alm 2 sel	R
	Dens alm 2 crit	R
	Reference density *)	R
	Density offset	R
	Pressure	R
	Pressure unit	R

Rev Fld Dev vars 1	Temperature unit	R
	Temp LRV	R
	Temp URV	R
	Temp damp	R
	Temp range select	R
	Temp alm 1 select	R
	Temp alm 1 crit	R
	Temp alm 2 select	R
	Temp alm 2 crit	R
	Temp fixed value *)	R
	Velocity unit	R
Rev Fld Dev vars 2	Conc meas Unit	R
	Conc meas LRV	R
	Conc meas URV	R
	Conc meas damp	R
	Conc meas lowcut	R
	Conc alm 1 select	R
	Conc alm 1 crit	R
	Conc alm 2 sel	R
	Conc alm 2 crit	R
	Net flo select	R
	Net flo unit	R
	Net flo LRV	R
	Net flo URV	R
	Net flo damping	R
	Net flo lowcut	R
	Net flo alm 1 sel	R
	Net flo alm 1 crit	R
	Net flo alm 2 sel	R
	Net flo alm 2 crit	R
Rev Outputs /Input	Analog 1 select *)	R
	PV Alarm 1 select	R
	PV Analog 1 low LMT	R
	PV Analog 1 high LMT	R
	Analog 2 select	R
	SV Alarm 2 select	R
	SV Analog 2 low LMT	R
	SV Analog 2 high LMT	R
	Pulse/Stat 1 sel	R
	Pulse 1 select *)	R
	Pls Unit	R
	Pls Rate *)	R
	Pls Mode	R
	Pls Width *)	R
	Pls Alarm	R
	SO 1 function *)	R
	SO 1 active mode *)	R
	Pulse/Stat 2 select	R
	Pulse 2 select	R
	Pls Unit	R

	Pls Rate	R
	Pls Mode	R
	Pls Width	R
	Pls Alarm	R
	SO 2 function	R
	SO 2 active mode	R
	Input function	R
	SI active mode	R
	PV is	R
	SV is	R
	TV is	R
	QV is	R
	Total flex select	R
	F-Totl flex Unit	R
	F-Totl mass Unit	R
	F-Totl vol Unit	R
	F-Totl net Unit	R
	F-Totl energy Unit	R
	Heat of combust unit	R
	Heat of combustion	R
	Total switch sel	R
	Total limit switch	R
	Total at alarm	R
	Total res cntrl	R
Rev HART	Poll addr	R
	Num req pream	R
	Num resp pream	R

3.5 Mass flow functions (Basic or Detailed Setup)

Mass flow	To set the functions of mass flow measurement.
Mass flow unit	Select: **g/s, g/min, g/h, kg/s, kg/min, kg/h, kg/d, t/min, t/h, t/d, lb/s, lb/min, lb/h, lb/d**
Mass flow format	Select: **xxxxxxx,xxxxx.X, xxxx.XX, xxx.XXX, xx.XXXX, x.XXXXX**
Mass flow LRV (low range value)	Set a mass flow value to the 4 mA or 0 Hz. LRV can also be negative to measure reverse flow.
Mass flow URV (upper range value)	Set a mass flow value to the 20 mA or xxxxxHz. Abs(URV-LRV) ≥ 5% of Qnom for liquids and 1% for gases
Mass flow damping	Set the damping time in s. Damping time affects outputs and display. After 5 times damping time the given value is displayed (t=63%).
Mass flow lowcut	Set the low cut. Low cut affects outputs and display and applies to negative and positive flow. A hysteresis of 0.05% of Qnom is given by the system.
Mass flow alm 1 sel	Select: **No function, More than, Less than**
Mass flow alm 1 crit	Select a mass flow alarm level. What happens in case of an alarm has to be defined in Status out (3.12, 3.13).
Mass flow alm 2 sel	Select: **No function, More than, Less than**
Mass flow alm 2 sel Restrictions: All alarms have to be in 0-110% of URV-LRV. Alarm criteria 2 must always be larger than alarm criteria 1.	Select a mass flow alarm level. What happens in case of an alarm has to be defined in Status out (3.12, 3.13).
Mass flow fix val sel	Select: **Inhibit, Enable**
Mass flow fixed value	Select a fix Mass flow value (only for test purpose or in case of maintenance). The set value is added to the actual value. In case of no flow it will vary with the zero fluctuation.

3.6 Volume flow functions (Basic or Detailed Setup)

Volume flow	To set the functions of volume flow measurement. Notice: Volume flow is derived density and mass flow measurement. Errors in density measurement (e.g. from gas bubbles) effects the accuracy of volume flow. For liquid it is recommended to use mass flow as original measurement. Density below roh = 0.3 kg/l volume flow is set to zero (for liquids)
Vol flow unit	Select: **cm³/s, cm³/min, cm³/h, l/s, l/min, l/h, l/d, m³/s, m³/min, m³/h, m³/d, gal/s, gal/min, gal/h, gal/d, Cuft/s, Cuft/min, Cuft/h, Cuft/d, bbl/s, bbl/min, bbl/h, bbl/d, Impgal/s, Impgal/min, Impgal/h, Impgal/d, l(N)/s, l(N)/min, l(N)/h, l(N)/d, m³(N)/s, m³(N)/min, m³(N)/h, m³(N)/d, Sl/s, Sl/min, Sl/h, Sl/d, Scuft/s, Scuft/min, Scuft/h, Scuft/d, Sm³/s, Sm³/min, Sm³/h, Sm³/d** **l(N)/s, l(N)/min, l(N)/h, l(N)/d, m³(N)/s, m³(N)/min, m³(N)/h, m³(N)/d** only for gas application. **Sl/s, Sl/min, Sl/h, Sl/d, Scuft/s, Scuft/min, Scuft/h, Scuft/d, Sm³/s, Sm³/min, Sm³/h, Sm³/d** only for gas application or if Reference density value is selected.
Vol flow format	Select; **xxxxxxx, xxxxx.X, xxxx.XX, xxx.XXX, xx.XXXX, x.XXXXX**
Vol flow LRV (low range value)	Set a volume flow value to the 4 mA or 0 Hz. LRV can also be negative to measure reverse flow.
Vol flow URV (upper range value)	Set a volume flow value to the 20 mA or xxxxx Hz. Abs(URV-LRV) ≥ 5% of Qvnom for liquids. For gas application Abs(URV-LRV) ≥ 1%
Vol flow damping	Set the damping time in s. Damping time affects outputs and display. After 5 times damping time the given value is displayed (t=63%)
Vol flow lowcut	Set the low cut. Low cut affects outputs and display. Any low cut on mass flow will affect volume flow also. A hysteresis of 0.05% of Qnom on mass flow is given by the system.
Vol flow alm 1 sel	Select: **No function, More than, Less than**
Vol flow alm 1 crit	Select a volume flow alarm level. What happens in case of an alarm has to be defined in Status (3.12, 3.13).
Vol flow alm 2 sel	Select: **No function, More than, Less than**
Vol flow alm 2 crit Restrictions: All alarms have to be in 0-110% of URV-LRV. Alarm criteria 2 must always be larger than alarm criteria 1.	Select a volume flow alarm level. What happens in case of an alarm has to be defined in Status out (3.12, 3.13).

3.7 Density functions (Basic or Detailed Setup)

Density	To set the functions of density measurement. Notice: Density measurement is only reliable if there is no gas in the liquid. For liquid measurement a density lower 0.3 kg/l is displayed as 0.0 kg/l. For gas measurement set a fixed density value.
Density unit	Select: **g/ml, kg/l, kg/m³, lb/gal, lb/Cuft, g/cm³, g/l, °Bé hv, °Bé lt, °API** **°Bé hv, °Bé lt, °API** only with option /CST
Density format	Select: **xxxxxxx, xxxxx.X, xxxx.XX, xxx.XXX, xx.XXXX, x.XXXXX**
Density LRV (low range value)	Set a density value to the 4 mA or 0 Hz.
Density URV (upper range value)	Set a density value to the 20 mA or xxxxx Hz. Abs(URV-LRV) ≥ 0.05 kg/l
Density damping	Set the damping time in s. Damping time affects outputs and display. After 5 times damping time the given value is displayed (t=63%)
Density lowcut	Set the low cut. Low cut affects outputs and display.
Density alm 1 sel	Select: **No function, More than, Less than**
Density alm 1 crit	Select a density alarm level. What happens in case of an alarm has to be defined in Status out (3.12, 3.13).
Density alm 2 sel	Select: **No function, More than, Less than**
Density alm 2 crit Restrictions: All alarms have to be in 0-110% of URV-LRV Alarm criteria 2 must always be larger than alarm criteria 1.	Select a density alarm level. What happens in case of an alarm has to be defined in Status out (3.12, 3.13).
Density Fix val sel **(only software revision lower than 1.8.20)**	Select: **Inhibt**, **Enable**
Ref. Density sel **(from software revision 1.8.20)**	Select: Inhibit, Fixed, Calculated If Fixed or Calculated is selected, reference density and corrected volume flow is output. Otherwise measured density and volume flow is output. Calculated reference density is not available if concentration measurement (option /Cxx) or gas measurement (option /GA) is activated.
Reference density	Set a fixed reference density value. For gas measurement (option / GA) set here your actual density for output of volume flow. For output of standard or normal volume flow set the standard or normal density of your gas accordingly. For liquid measurement this parameter can also be used to enter the standard density of your liquid for output of standard volume flow or for the actual density in case of density disturbances.

<table>
<tr><td>Reference density setup
(from software revision 1.8.20)</td><td>To setup the coefficients used for calculating the reference density.

$\rho ref = \rho (1 + a \Delta t + b \Delta t^2)$; $\Delta t = t - tref$

ρref : density at reference temperature
ρ : measured density
t : measured temperature
tref : reference temperature
a : linear thermal expansion coefficient
b : quadratic thermal expansion coefficient</td></tr>
<tr><td>Reference temperature
(from software revision 1.8.20)</td><td>Set the reference temperature for the reference density calculation.</td></tr>
<tr><td>Temp. coeff. a
(from software revision 1.8.20)</td><td>Set the linear thermal expansion coefficient of the liquid for the reference density calculation.</td></tr>
<tr><td>Temp. coeff. b
(from software revision 1.8.20)</td><td>Set the quadratic thermal expansion coefficient of the liquid for the reference density calculation.</td></tr>
<tr><td>Density offset</td><td>If the Rotamass detector is installed horizontally (bend down) the value from the following table must be entered according to the concerning sensor model.
<table>
<tr><td>RCCS30LR</td><td>5.25 g/l</td></tr>
<tr><td>RCCS30</td><td>2.70 g/l</td></tr>
<tr><td>RCCS31</td><td>1.80 g/l</td></tr>
<tr><td>RCCS32</td><td>2.00 g/l</td></tr>
<tr><td>RCCS33</td><td>0.60 g/l</td></tr>
<tr><td>RCCx34</td><td>0.90 g/l</td></tr>
<tr><td>RCCx36</td><td>0.35 g/l</td></tr>
<tr><td>RCCx38 to 39/XR</td><td>0 g/l (default)</td></tr>
</table>
ROTAMASS is density-calibrated vertically. If the ROTAMASS detector is installed horizontal an density
offset value from the above table has to be entered to the parameter reference density. As positive values if the tubes are down and as negative value if the tubes are up.</td></tr>
<tr><td>Pressure</td><td>Set the average static line pressure.
Static pressure effect on density and mass flow will be corrected automatically.</td></tr>
<tr><td>Pressure unit</td><td>Select: bar, psi, MPa</td></tr>
</table>

3.8 Temperature functions (Basic or Detailed Setup)

Temperature	To set the functions of temperature measurement. Notice: Standard range: -200 to 230°C High temp. range (/HT): 0 to 400°C
Temperature Unit	Select: **degC, degF, K**
Temperature format	Select: **xxxxxxx, xxxxx.X, xxxx.XX, xxx.XXX, xx.XXXX, x.XXXXX**
Temperature LRV (low range value)	Set a temperature value to the 4 mA or 0 Hz
Temperature URV (upper range value)	Set a temperature value to the 20 mA or xxxxx Hz. Abs(URV-LRV) ≥ 10K
Temperature damping	Set the **damping time** in s. Damping time affects outputs and display. After 5 times damping time the given value is displayed (t=63%).
Temperature alm 1 sel	Select: **No function, More than, Less than**
Temperature alm 1 crit	Select a **temperature alarm** level. What happens in case of an alarm has to be defined in Status out (3.12, 3.13).
Temperature alm 2 sel	Select: **No function, More than, Less than**
Temperature alm 2 crit Restrictions: All alarms have to be in 0-110% of URV-LRV Alarm criteria 2 must always be larger than alarm criteria 1.	Select a **temperature alarm** level. What happens in case of an alarm has to be defined in Status out (3.12, 3.13).
Temperature fix val select	Select: **Inhibit, Enable**
Temperature fixed value	Select a temperature value in case of malfunction of the built in temperature sensor.
Temperature gain	Change the gain by setting a factor different from 1. The ROTAMASS temperature sensor is installed outside of the measuring tubes. So at high or low fluid temperature the temperature measurement may show a deviation as a function of the quality of heat insulation. This function allows correcting temperature measurement for better accuracy in mass flow and density. Note: It is not recommended to use this function unless correct measurement over the complete process temperature range can be confirmed. It is not sufficient to proof correct measurement at one temperature or in a very narrow temperature range unless the process operates exclusively within this range.

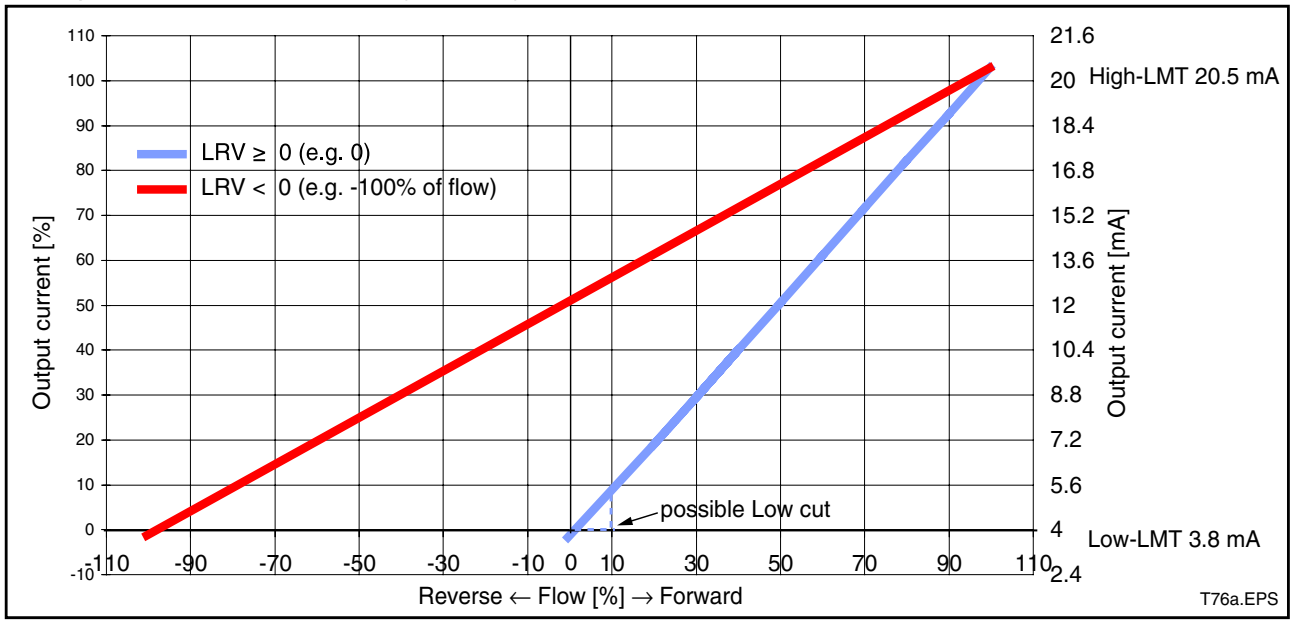
3.9 Velocity functions (Detailed Setup)

Velocity	To set the function of the medium velocity. Not available for gas measurement (/GA) Velocity is not calculated if reference density is enabled.
Velocity unit	Select: **m/s, ft/s**

3.10 Analog 1 functions (Basic or Detailed Setup)

Analog output 1	To set the current output 1. This output provides HART communication.
Analog 1 select	Select: **Mass flow (0), Volume flow (1), Density (2), Temperature (3), Concentration meas (4), Net flow (5), None (6)** Numbers may be displayed if selected via HART. If **None** is selected, output is 4 mA, HART communication is available.
Analog 1 alarm out (Detailed setup, configure output/input)	**Select: <2.4 mA, <3.6 mA, <4 mA, >21 mA, >21.6 mA**
Analog 1 low LMT (low limit) (Detailed setup, configure output/ input) The alarm is active if the measured value is lower than the low limit.	Default: 3.8mA Setting range: 3.8 - 20.5 mA
Analog 1 high LMT (high limit) (Detailed setup, Configure output/ input) The alarm is active if the measured value is higher than the high limit.	Default: 20.5mA Setting range: 3.8 - 20.5 mA

Example for Bi-directional flow (NAMUR):



3.11 Pulse/Status output 1 functions (Basic or Detailed Setup)

Pulse/Status out 1	To set the pulse/status output 1.
Pulse/Stat 1 select	Select: **Pulse out, Status out, No function** If Pulse is selected, Status out 1 (SO) is not available. If **Status out** is selected, pulse parameters are not available.
Pulse 1 select	Select: **Mass flow (0), Volume flow (1), Density (2), Temperature (3), Concentration meas (4), Net flow (5), None (6), F-Total mass (7), R-Total mass (8), F-Total volume (9), R-Total volume (10), F-Total net (11), R-Total net (12)** Numbers may be displayed if selected via HART. If **F-Total mass, F-Total volume** or **F-Total net** are selected, pulse output only works at forward flow. If **R-Total mass, R-Total volume** or **R-Total net** are selected, pulse output only works at reverse flow.
Pulse 1 unit **NOTE** To select the pulse output mass or volume has to be selected. If mass flow or volume flow is selected the output delivers only frequency.	Select: **Hz, g/P, kg/P, t/P, lb/P, cm³/P, l/P, m³/P, gal/P, kgal/P, Cuft/P, bbl/P, Impgal/P, klmpgal/P, l(N)/P, m³(N)/P, Sl/P, Scuft/P, Sm³/P** If **Pulse 1 select** is **Mass flow, Volume flow, Density, Temperature** or **Concentration meas**, only **Hz** can be selected. If **Pulse 1 select** is **F-Total mass, R-Total mass, F-Total volume, R-Total volume, F-Total net** or **R-Total net** only **unit/P** can be selected. **l(N)/P, m³(N)/P** only for gas application. **Sl/P, Scuft/P, Sm³/P** only for gas application or if reference density value is selected.
Pulse 1 rate	The Pulse rate can be set according to the unit set in **Pulse 1 unit.** Pulse rate is 0 to 10000 Hz. Minimum output 20 Hz.
Pulse 1 active mode	Select: **On Active, Off Active** The output levels depending on this parameter are shown on page 7-91.
Pulse 1 width	Select: **0.05ms, 0.1ms, 0.5ms, 1ms, 5ms, 10ms, 50ms, 100ms, 500ms, 1000ms**
Pulse 1 at alarm	Select: **0P/0Hz, Measured value, Hold** If **0P/0Hz** is selected, in case of alarm the pulse output is stopped. If **Measured value** is selected, the pulse output keeps on measuring. If **Hold** is selected, the pulse output keeps the value before entering the alarm/error state.

SO 1 function	Select: **No Function, Flow direction, Total limit switch, Mass flow alm 1, Mass flow alm 2, Mass flow alm 1+2, Vol flow alm 1, Vol flow alm 2, Vol flow alm 1+2, Density alm 1,Density alm 2, Density alm 1+2, Temp alm 1, Temp alm 2, Temp alm 1+2, Concentration meas alm 1, Concentration meas alm 2, Concentration meas alm 1+2, Net flow alm 1, Net flow alm 2, Net flow alm 1+2, Slug alarm, Empty alarm, Corrosion alarm, All alarms, All errors, All alarms & errors** If **Flow direction** is selected, status output becomes active for forward flow and not active for reverse flow, if parameter **flow direction** set to **forward**. It is the other way round, if parameter **flow direction** is set to **reverse** (see 3.17). If **Total limit switch** is selected, status output becomes active, when the totalizer reaches the value set to parameter **Total limit switch** (see 3.17). If an alarm function is selected, status output becomes active, if the concerning alarm occurs. If **All alarms** is selected, status output becomes active, if at least one alarm occurs. The same applies for errors with the setting All errors. For **All alarms & errors** the status output becomes active, if at least one alarm or one error occurs.
SO1 active mode	Select: **On Active, Off Active** The output levels depending on this parameter are shown on page 7-94.

How to set status, pulse or frequency output (using the display keys, equivalent via HART)

Status

Basic Setup or **Detailed Setup**
Pulse/Status out 1
Pulse/Stat 1 select
Select : **Status out**

Pulse or Frequency

Basic Setup or **Detailed Setup**
Pulse/Status out 1
Pulse/Stat 1 select
Select : **Pulse**
Pulse 1 select

F-Total mass	→	**Pulse**
R-Total mass	→	**Pulse**
F-Total volume	→	**Pulse**
R-Total volume	→	**Pulse**
F-Total net	→	**Pulse**
R-Total net	→	**Pulse**
Mass Flow	→	**Frequency**
Volume Flow	→	**Frequency**
Net Flow	→	**Frequency**
Density	→	**Frequency**
Temperature	→	**Frequency**
Concentration meas.	→	**Frequency**

Notice : By selecting a variable (mass or volume) which can be totalized automatically the pulse output is selected.

If **Pulse** is selected, under **Basis Setup** the
Pulse unit and
Pulse rate
have to be defined.
Under ´Detailed Setup´
Pulse unit
Pulse rate
Pulse active mode and
Pulse width
have to be defined.
If the pulse output is set under **Basic Setup**, the pulse width is the width set under **Detailed Setup**
If the pulse width is not configured under **Detailed Setup** menu the **pulse width** will be set default to 1ms.
If ´frequency´ is selected the frequency generated at URV (upper range value) has to be defined.
Default is URV = 1000Hz.

Differences between Pulse and Frequency output

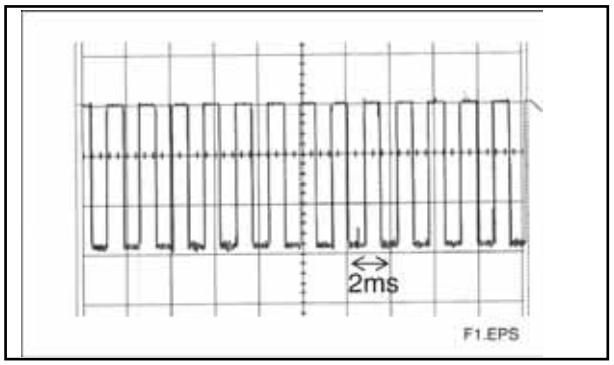
For pulse output the mass (or volume) is internally totalized and if the increment is reached, one pulse is sent.
For a frequency output the measured value is calculated in actual frequency according to the definition of the user (e.g. 10000 Hz = 54321 kg/h) with 50% duty cycle.
Set as frequency output the pulse length is changing with the change of the measured value.

NOTE

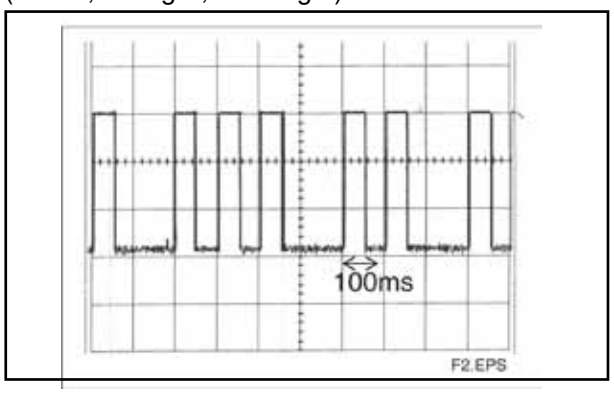
At frequencies above 500 Hz, frequency output 1 inserts gaps in the pulse train. Therefore it is required to use a minimum pulse integration time of 10 sec. to get accurate frequency measurements. If shorter pulse integration time is necessary e.g. for batching applications, it is recommended to use frequency output 1 up to max. 500 Hz.

Set as a pulse output the pulse length is constant but the time between the pulses varies. Even at constant flow the time between the pulses might vary because the microprocessor has to find a suitable gap in its timing to send the pulse.

Typical pattern for frequency output :



Typical pattern for pulse output
(50 ms; 0.1 kg/P; 2580 kg/h) :



Setting the pulse output

Because the duty cycle of pulses is max. 50%, the max. flowrate is restricted by the pulse width, the unit and the pulse rate :

Max. flow rate =
1s/(pulse width*2) *pulse rate *time factor

Example :

Max. Q should be calculated in kg/min
Pulse width = 50 ms
Pulse rate = 0.1 kg/P
Time factor (related to s) = 60 P/min
Max. Q = 1s/(0.05s *2) *0.1kg/P * 60P/min = 60kg/min

If the flow is higher than max.Q pulses will be lost. Therefore it is mandatory to choose the pulse width/rate so, that the calculated max.Q is always 10% higher than the maximum expected flowrate.

10% higher is recommended because the duty cycle is not always exact 50%. For certain pulse widths the duty cycle at max.Q is larger than 50% so fewer pulses can be generated. These pulses are delivered later when the flowrate is again below max.Q minus 10%. To avoid this situation it is recommended to keep the flowrate always 10% below max.Q.

Example :

Flowrate : 11 t/h
Pulse unit : kg
Pulse rate : 0.1 kg/P
Time factor (related to s) = 3600 P/h

Check :

Lowest pulse width
= 0.5 s*pulse rate* time factor/ max. flow rate
= 0.5 s*0.1 kg/P *3600 P/h /(11000 kg/h)
= 16.4 ms

→ customer should select 10 ms pulse width or lower.

Max. Q = 18000 kg/h
11000 kg/h < 18000 kg/h - 10%

Result :

Pulse width = 10 ms
Pulse rate = 0.1 kg/P

For a first orientation the max. Q for certain pulse widths and units for a pulse rate of 0.1, 1 and 10 are given in the table 7-1.

Max. flow restriction :

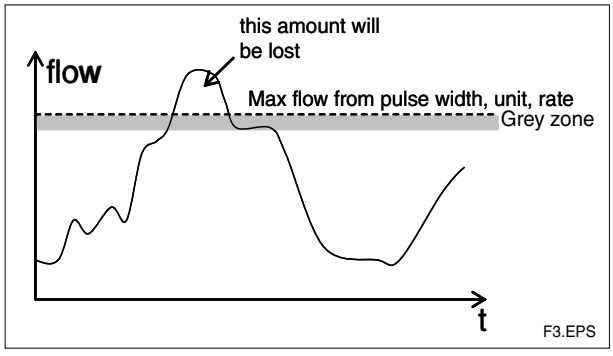


Table 7-1: Max. flowrate for different pulse settings reduced by 10%:

		Pulse Width in ms									
		1000	500	100	50	10	5	1	0.5	0.1 **	0.05 **
		Max. pulse sending frequency for the different pulse settings in P/s									
		0.45	0.9	4.5	9	45	90	450	900	4500	9000
Pulse Unit	Pulse rate	Maximum Flow Rate *									
g	0.1	162 g/h	324 g/h	1.62 kg/h	3.24 kg/h	16.2 kg/h	32.4 kg/h	162 kg/h	324 kg/h	1.62 t/h	3.24 t/h
g	1	1.62 kg/h	3.24 kg/h	16.2 kg/h	32.4 kg/h	162 kg/h	324 kg/h	1.62 t/h	3.24 t/h	16.2 t/h	32.4 t/h
g	10	16.2 kg/h	32.4 kg/h	162 kg/h	324 kg/h	1.62 t/h	3.24 t/h	16.2 t/h	32.4 t/h	162 t/h	324 t/h
kg	0.1	162 kg/h	324 kg/h	1.62 t/h	3.24 t/h	16.2 t/h	32.4 t/h	162 t/h	324 t/h	1620 t/h	3240 t/h
kg	1	1.62 t/h	3.24 t/h	16.2 t/h	32.4 t/h	162 t/h	324 t/h	1620 t/h	3240 t/h	16200 t/h	---
kg	10	16.2 t/h	32.4 t/h	162 t/h	324 t/h	1620 t/h	3240 t/h	16200 t/h	---	---	---
t	0.1	162 t/h	324 t/h	1620 t/h	3240 t/h	16200 t/h	---	---	---	---	---
t	1	1620 t/h	3240 t/h	16200 t/h	---	---	---	---	---	---	---
t	10	16200 t/h	---	---	---	---	---	---	---	---	---

*) Maximum Flow rate is also limited by sensor size

** Note for pulse output 2: Pulse width 0.1 ms & 0.05 ms are only implemented for convenience. Due to the limited bandwidth proper function can not be guaranteed.

The following tables show the physical output levels of the pulse / status outputs depending on the setting of parameter Pulse 1/2 active mode or SO 1/2 active mode.

On active				
Output	Situation	Output transistor	Level Pout+	Level Pout+
			Passive	Active (/AP)
Pulse/Status out 1	No Alarm/No Pulse	open (OFF)	High (Us)*	High (15 VDC)
	Alarm/Pulse	closed (ON)	Low (≤ 1 V)	Low (≤ 1 V)
			Level Sout+	
Pulse/Status out 2	No Alarm/No Pulse	open (OFF)	High (Us)*	
	Alarm/Pulse	closed (ON)	Low (≤ 1 V)	

Off active				
Output	Situation	Output transistor	Level Pout+	Level Pout+
			Passive	Active (/AP)
Pulse/Status out 1	No Alarm/No Pulse	closed (ON)	Low (≤ 1 V)	Low (≤ 1 V)
	Alarm/Pulse	open (OFF)	High (Us)*	High (15 VDC)
			Level Sout+	
Pulse/Status out 2	No Alarm/No Pulse	closed (ON)	Low (≤ 1 V)	
	Alarm/Pulse	open (OFF)	High (Us)*	

*) Us is the external power supply voltage of the pulse / status output

3.12 Pulse/Status output 2 functions (Basic or Detailed Setup)

Pulse/Status out 2	To set the pulse/status output 2.
Pulse/Stat 2 select	Select: **Pulse out, Status out, No function** If Pulse is selected, Status out 2 (SO) is not available. If **Status out** is selected, pulse parameters are not available.
Pulse 2 select	Select: **Mass flow (0), Volume flow (1), Density (2), Temperature (3), Concentration meas (4), Net flow (5), None (6), F-Total mass (7), R-Total mass (8), F-Total volume (9), R-Total volume (10), F-Total net (11), R-Total net (12)** Numbers may be displayed if selected via HART. If **F-Total mass, F-Total volume** or **F-Total net** are selected, pulse output only works at forward flow. If **R-Total mass, R-Total volume** or **R-Total net** are selected, pulse output only works at reverse flow.
Pulse 2 unit **NOTE** To select the pulse output mass or volume has to be selected. If mass flow or volume flow is selected the output delivers only frequency.	Select: **Hz, g/P, kg/P, t/P, lb/P, cm³/P, l/P, m³/P, gal/P, kgal/P, Cuft/P, bbl/P, Impgal/P, klmpgal/P, l(N)/P, m³(N)/P, Sl/P, Scuft/P, Sm³/P** If **Pulse 2 select** is **Mass flow, Volume flow, Density, Temperature** or **Concentration meas**, only **Hz** can be selected. If **Pulse 2 select** is **F-Total mass, R-Total mass, F-Total volume, R-Total volume, F-Total net** or **R-Total net** only **unit/P** can be selected. **l(N)/P, m³(N)/P** only for gas application. **Sl/P, Scuft/P, Sm³/P** only for gas application or if Reference density value is selected.
Pulse 2 rate	The Pulse rate can be set according to the unit set in **Pulse 2 unit.** Pulse rate is 0 to 2000 Hz. Minimum output 20 Hz.
Pulse 2 active mode	Select: **On Active, Off Active** The output levels depending on this parameter are shown on page 7-91.
Pulse 2 width	Select: **0.05ms, 0.1ms, 0.5ms, 1ms, 5ms, 10ms, 50ms, 100ms, 500ms, 1000ms**
Pulse 2 at alarm	Select: **0P/0Hz, Measured value, Hold** If **0P/0Hz** is selected, in case of alarm the pulse output is stopped. If **Measured value** is selected, the pulse output keeps on measuring. If **Hold** is selected, the pulse output keeps the value before entering the alarm/error state.

SO 2 function	Select: **No Function, Flow direction, Total limit switch, Mass flow alm 1, Mass flow alm 2, Mass flow alm 1+2, Vol flow alm 1, Vol flow alm 2, Vol flow alm 1+2, Density alm 1,Density alm 2, Density alm 1+2, Temp alm 1, Temp alm 2, Temp alm 1+2, Concentration meas alm 1, Concentration meas alm 2, Concentration meas alm 1+2, Net flow alm 1, Net flow alm 2, Net flow alm 1+2, Slug alarm, Empty alarm, Corrosion alarm, All alarms, All errors, All alarms & errors** If **Flow direction** is selected, status output becomes active for forward flow and not active for reverse flow, if parameter **flow direction** set to **forward**. It is the other way round, if parameter **flow direction** is set to **reverse** (see 3.17). If **Total limit switch** is selected, status output becomes active, when the totalizer reaches the value set to parameter **Total limit switch** (see 3.17). If an alarm function is selected, status output becomes active, if the concerning alarm occurs. If **All alarms** is selected, status output becomes active, if at least one alarm occurs. The same applies for errors with the setting All errors. For **All alarms & errors** the status output becomes active, if at least one alarm or one error occurs.
SO2 active mode	Select: **On Active, Off Active** The output levels depending on this parameter are shown on page 7-94.

Detailed information about using the pulse and status output see chapter 3.12.

3.13 Status input functions (Basic or Detailed Setup)

Status input	To set the **status input**.
SI function	Select: **No function, Autozero, Reset flex totals, Reset mass totals, Reset volume totals, Reset net totals, Reset all totals, 0% signal lock** If **Autozero** is selected, active status input starts autozero procedure. If **0% signal lock** is selected, analog outputs 1 and 2 are fixed to 4 mA while status input is active. If parameter **Total reset cntrl** is enabled: - If **Reset flex totals** is selected, active status input sets **flex totalizer** to zero. - If **Reset mass totals** is selected, active status input sets mass totalizer to zero. - If **Reset volume totals** is selected, active status input sets volume totalizer to zero. - If **Reset net totals** is selected, active status input sets net totalizer to zero. - If **Reset all totals** is selected, active status input sets all totalizer to zero.
SI active mode	Select: **On Active, Off Active** If **On Active** is selected, the status input is closed active. If **Off Active** is selected, the status input is open active.

3.14 HART output (Detailed Setup)

HART output	To set the assignments of HART device variables which are reported via HART Universal Command 3.
PV is	Set the assignment of Primary variable (PV). PV is linked to Analog output 1. Changing of PV will change the assignment of Analog output 1 and vice versa. Select: **Mass flow, Volume flow, Density, Temperature, Concentration meas, Net flow, None**
SV is	Set the assignment of Secondary variable (SV). SV is linked to Analog output 2. Changing of SV will change the assignment of Analog output 2 and vice versa. Select: **Mass flow, Volume flow, Density, Temperature, Concentration meas, Net flow, None** If Analog output 2 is not available (option /KF2) an extended selection is available, see “HART Variable list” below.
TV is	Set the assignment of Tertiary variable (TV). TV is linked to Pulse output 1 if **Pulse/Stat 1 sel** is set to **Pulse.** In this case changing of TV will change the assignment of Pulse output 1 and vice versa. Select: **Mass flow, Volume flow, Density, Temperature, Concentration meas, Net flow, None, F-Total mass, R-Total mass, F-Total volume, R-Total volume, F-Total net, R-Total net** If **Pulse/Stat 1 sel** is set to **Status out** or **No function** an extended selection is available, see “HART Variable list” below . This selection is stored separately from the selection for “Pulse”.
QV is	Set the assignment of Quaternary variable (QV). QV is linked to Pulse output 2 if **Pulse/Stat 2 sel** is set to **Pulse.** In this case changing of QV will change the assignment of Pulse output 2 and vice versa. Select: **Mass flow, Volume flow, Density, Temperature, Concentration meas, Net flow, None, F-Total mass, R-Total mass, F-Total volume, R-Total volume, F-Total net, R-Total net** If Pulse output 2 is not available (option /KF2) or **Pulse/Stat 2 sel** is set to **Status out** or **No function** an extended selection is available, see “HART Variable list” below. This selection is stored separately from the selection for “Pulse”.
HART Variable list **(For HART- communication: Variables which are not allowed will be rejected by "Invalid Selection")**	**Mass flow, Volume flow, Density, Temperature, Concentration meas, Net flow, None, F-Total mass, R-Total mass, F-Total volume, R-Total volume, F-Total net, R-Total net, F-Total flex, R-Total flex, D-Total mass, D-Total volume, D-Total net, D-Total flex, F-Total energy, Velocity, Drive Gain**

3.15 Totalizer functions (Basic or Detailed Setup)

Totalizer	To set totalizer function. Totalizer increments the forward flow if flow direction is forward or the reverse flow if flow direction is reverse.
Total flex select	Flex totalizer is available as a secondary total for mass, volume or net. Select: **Mass, Volume, Net** If assignment is changed Flex totalizer will be set to zero, **Total flex unit** will be set to default.
Total flex unit	When **Total flex select** is set to **Mass** or **Net**, the **Total flex unit g, kg, t, lb** can be selected. When **Total flex selec**t is set to **Volume** or **Net**, the **Total flex unit cm³, l, m³, gal, kgal, Cuft, bbl, Impgal, kImpgal, l(N), m³(N), Sl, Scuft, MMscuft, Sm³** can be selected. **l(N), m³(N)** only for gas application. **Sl, Scuft, MMscuft, Sm³** only for gas application or if Reference density value is selected.
Total mass unit	Select: **g, kg, t, lb**
Total volume unit	For **Total volume un**it **cm³, l, m³, gal, kgal, Cuft, bbl, Impgal, kImpgal, l(N), m³(N), Sl, Scuft, MMscuft, Sm³** can be selected. **l(N), m³(N)** only for gas application. **Sl, Scuft, MMscuft, Sm³** only for gas application or if **Reference density value** is selected.
Total net unit	For option /CST: When **Net flow select** is set to **Mass**, the **Total net unit g, kg, t, lb** can be selected. When **Net flow selec**t is set to **Volume**, the **Total net unit cm³, l, m³, gal, kgal, Cuft, bbl, Impgal, kImpgal** can be selected. For option /Cxx: Selection depends from concentration unit.
Total energy unit	Select: **MJ, Btu**
Energy factor/Heat of combustion	Set the calorific value of the medium with the unit Energy factor/ Heat of combust. unit. The totalized energy of the medium can be indicated on display by F-Total energy. Heat of combust. unit **MJ/kg, Btu/lb, MJ/m³(N)** and **Btu/Scuft** can be selected.
Total switch select	Select: **Flex Total, Mass Total, Volume Total, Net Total**
Total limit switch	A totalizer limit can be set only to the forward totalizer selected in **Total select**. If status output is set to **Total switch**, status output is set active, if the totalizer reaches this value. Total switch is not active if set to 0.0.
Total at alarm	Select: **Hold, Continue Total** Characteristic of totalizer selected in **Total select** in case of the **Total switch** is active. If **Hold** is selected forward and reverse totalising stops.
Total reset cntrl	Select: **Inhibit, Enable** Enables or inhibits total reset.

Total reset	Select: **Not Execute, Reset flex totals,** **Reset mass totals, Reset volume totals,** **Reset net totals, Reset all totals** After execution of reset totals, forward and reverse total of the selected totalizer will be set to zero.
If the total value 9999999 is reached, the indication changes to exponential type. During exponential indication the resolution is lower. If full accuracy is needed, total reset must be executed to reach precise indication.	

3.16 Flow direction function (Detailed Setup)

Flow direction	Select: **Forward, Reverse** See 3.12 and 3.13 according influence on status output (**SO 1/2 functio**n = **Flow direction**) If **Reverse** is selected, the flow direction in the other direction of the arrow on the detector is used as positive values of flow.

3.17 Concentration measurement (Detailed Setup)

Concentration meas (only for option/CST or /Cxx)	To set the functions of concentration measurement. For xx=00 to 99 a customer specific or defined table is stored in the converter in factory. For /CST temperature coefficients have to be determined by the customer.
Concentration meas unit (only available for option/CST)	Select: °**Brix, Wt-% sol, Vol% sol, Wt-%, Vol%**
Concentration meas format	Select: **xxxxxxx, xxxxx.X, xxxx.XX, xxx.XXX, xx.XXXX, x.XXXXX**
Concentration meas LRV (low range value)	Set a concentration value to the 4 mA or 0 Hz
Concentration meas (upper range value)	Set a **concentration value** to the 20 mA or xxxxx = Hz. **Abs(URV-LRV) ≥ 10%**
Concentration meas damping	Set the damping time in s. Damping time affects outputs and display. After 5 times damping time the given value is displayed (t=63%).
Concentration meas lowcut	Set the low cut. Low cut affects outputs and display.
Concentration meas alm 1 sel	Select: **No function, More than, Less than**
Concentration meas alm 1 crit	Select a concentration alarm level. What happens in case of an alarm has to be defined in Status out (3.12, 3.13).
Concentration meas alm 2 sel	Select: **No function, More than, Less than**
Concentration meas alm 2 crit Restrictions: All alarms have to be in 0-110% of URV-LRV Alarm criteria 2 must always be larger than alarm criteria 1.	Select a concentration alarm level. What happens in case of an alarm has to be defined in Status out (3.12, 3.13).
Concentration meas setup (only for option /CST)	To setup the coefficients used for calculation of concentration using the Standard Concentration Measurement.
Reference temperature	Set the temperature where the reference density of both components of the mixture has been determined.
Ref. density carrier	Set the density of the carrier liquid determined at the reference temperature.
Temp. coeff. a carrier	Set the linear temperature coefficient of the density of the carrier liquid.
Temp. coeff. b carrier	Set the squared temperature coefficient of the density of the carrier liquid.
Ref. density product	Set the density of the product determined at the reference temperature.
Temp. coeff. a product	Set the linear temperature coefficient of the density of the product.
Temp. coeff. b product	Set the squared temperature coefficient of the density of the product.
For more information on concentration measurement see TI "Concentration Measurement" TI 01R04B04-04E-E.	

3.18 Net flow (Detailed Setup)

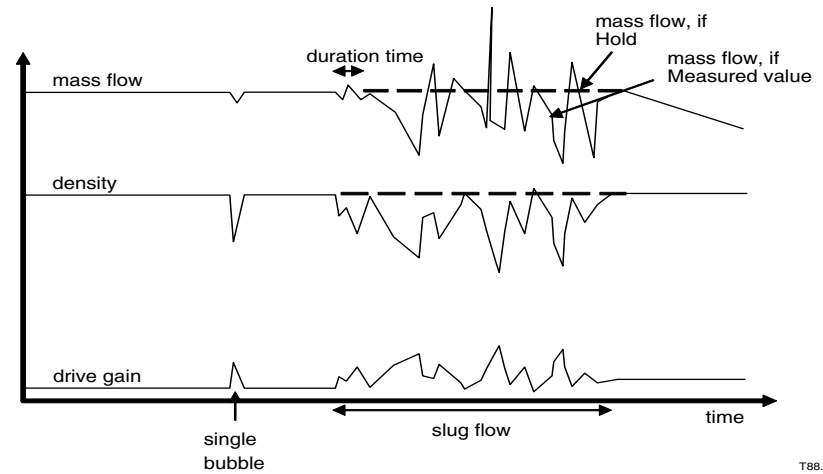
Net flow	To set the functions of net flow measurement. Net flow is only available if concentration measurement is activated (option /Cxx or /CST). The actual flow is multiplied with the concentration).
Net flow select (only available for option /CST)	Select: **Mass, Volume**
Net flow unit	When **Net flow select** is set to **Mass**: **g/s, g/min, g/h, kg/s, kg/min, kg/h, kg/d, t/min, t/h, t/d, lb/s, lb/min, lb/h, lb/d** can be selected When **Net flow select** is set to **Volume**: **cm³/s, cm³/min, cm³/h, l/s, l/min, l/h, l/d, m³/s, m³/min, m³/h, m³/d, gal/s, gal/min, gal/h, gal/d, Cuft/s, Cuft/min, Cuft/h, Cuft/d, bbl/s, bbl/min, bbl/h, bbl/d, Impgal/s, Impgal/min, Impgal/h, Impgal/d** can be selected
Net flow format	Select: **xxxxxxx, xxxxx.X, xxxx.XX, xxx.XXX, xx.XXXX, x.XXXXX**
Net flow LRV (low range value)	Set a net flow value to the 4 mA or 0 Hz.
Net flow URV (upper range value)	Set a net flow value to the 20 mA or xxxxx = Hz. Abs(URV-LRV) ≥ 5% of Qnom.
Net flow damping	Set the damping time in s. Damping time effects outputs and display. After 5 times damping time the given value is displayed (t=63%).
Net flow lowcut	Set the low cut effects output and display. A hysteresis of 0.05% of Qnom is given by the system.
Net flow alm 1 sel	Select: **No function, More than, Less than**
Net flow alm 1 crit	Select a net flow alarm level. What happens in case of an alarm has to be defined in Status out (3.12, 3.13)
Net flow alm 2 sel	Select: **No function, More than, Less than**
Net flow alm 2 crit Restrictions: All alarms have to be in 0-110% of URV-LRV Alarm criteria 2 must always be larger than alarm criteria 1.	Select a net flow alarm level. What happens in case of an alarm has to be defined in Status out (3.12, 3.13)

3.19 Slug detection (Detailed Setup)

Slug detection Not available if gas measurement is ordered.	Detection of bubble flow. After slug criteria has been reached, slug is supervised during slug duration. If slug is still detected after slug duration has expired, the selected action in **After slug** is taken. See below table.
Slug alarm select	Select: **Not apply, Apply**
Drive gain	To read drive gain. To set a suitable slug criteria the customer must know the drive gain level of normal flow condition and of slug flow condition. This function is suitable to evaluate this level.
Slug criteria	Above this drive gain level slug flow is assumed.
Slug duration	Duration time is designed to ignore short gas bubbles. Only after Slug duration has expired the setting in After slug will be taken in account. In normal slug application set slug duration to zero.
After slug	Select: **Measured value, Hold** If **Hold** is selected mass flow and density keep their value before occurrence of the slug alarm and as long as slug alarm is detected.
Drive gain damping	Set drive gain damping time to get a constant drive gain level.

<table>
<tr><td colspan="5">Gas application?</td></tr>
<tr><td>Yes</td><td colspan="4">No</td></tr>
<tr><td rowspan="6">Slug detection off</td><td colspan="4">Slug alarm select = Apply?</td></tr>
<tr><td colspan="3">Yes</td><td>No</td></tr>
<tr><td colspan="3">Drive gain > Slug criteria?</td><td rowspan="5">Slug detection off</td></tr>
<tr><td colspan="2">Yes</td><td rowspan="3">No</td></tr>
<tr><td colspan="2">Duration active?</td></tr>
<tr><td>Yes</td><td>After duration</td></tr>
<tr><td>Function active
Alarm off
Measurement continued</td><td>Slug detection On
Alarm on
Measurement continued
or value hold</td><td>Slug detection off
Alarm off</td></tr>
</table>

Influence of slug on mass flow, density and drive gain :



3.20 Empty pipe detection (Detailed Setup)

Empty pipe detection Not available if gas measurement (option /GA) is ordered. Not working if fixed reference density is enabled.	Detection of empty pipe After **Empty pipe crit** has been reached, alarm output is activated if selected. This function can also be used to detect tube failure (see chapter 8.8).
Empty pipe alm sel	Select: **Not apply, Apply**
Empty pipe crit	Set density value as criteria when empty pipe alarm should happen. If **Empty pipe crit** is smaller than **Density URV** (or LRV, whichever is higher), alarm appears if density is lower than **Empty pipe crit**. If **Empty pipe cri**t is equal or greater than **Density URV** (or LRV, whichever is higher), alarm appears if density is higher than **Empty pipe crit.**
After empty pipe	Select the behaviour of the outputs after empty pipe has happened. Select: **Massflow = Zero, Measured Value, Hold** With this function the outputs can be set to zero if the detector runs empty during maintenance. It is also useful for batching if the batch starts with an empty pipe. In such case please install the detector vertically.

Gas application?					
Yes	No				
	Empty pipe alm sel = Apply?				
	Yes				No
	Empty pipe crit < Density URV? (or LRV, whichever is higher)		Empty pipe crit ≥ Density URV? (or LRV, whichever is higher)		
	Yes	No	Yes	No	
Empty pipe OFF Alarm off	Empty pipe ON Alarm On if density < empty pipe crit Outputs either Measured Value, Hold or 4mA/0Hz	Empty pipe OFF Alarm off	Empty pipe ON Alarm On if density ≥ empty pipe crit Outputs either Measured Value, Hold or 4mA/0Hz	Empty pipe OFF Alarm off	Empty pipe OFF Alarm off

3.21 Corrosion detection (Detailed Setup)

Corrosion detection Not available if gas measurement is ordered. Not working if fixed reference density is enabled. This function is useful if the max. density of the fluid is known and corrosion may happen. As alternative to this function the user can watch density periodically.	Detection of corrosion in pipe. After density value stored in **Corrosion crit** has been reached, alarm output is activated if selected. This function is only good for liquids with relative constant density. Set an upper density level. If this density level is reached permanently, a warning occurs.
Corrosion alm sel	Select: **Not apply, Apply**
Corrosion crit	Set density value up to **Density URV** or **Density LRV** (whichever is higher)
Corrosion damp	Set damping on density for comparison with **Corrosion crit,** up to 10h.

3.22 Detector data (Detailed Setup)

The sensor model is defined in Parameter Detailed Setup / Sensor model :

> ⚠ **WARNING**
> The function Sensor model is only for changing a converter in case of maintenance.
> Never change the sensor model if the sensor is not changed.

The sensor constants for the selected detector are stored in parameters Detailed Setup / Sensor constants. You find the main sensor constants on the name plate. In case of doubt of the measured value please confirm that the proper sensor constants are stored.

The serial number of the converter is stored in ´Detailed Setup / Device Information / Serial no. Converter´. The serial number of the detector is stored in ´Detailed Setup / Device Information / Serial no. Detector´. For compact version RCCT3 there is only one serial number.

The tag number, if provided by the customer (option /BG), is stored in Basic setup / Tag.

For integral type RCCT3x and remote type RCCF31 / RCCR31 combined ordered with RCCS3x the detector data are factory stored in the concerning parameters. For not combined remote type RCCF31 with option /NC see chapter 5.5.

If the parameter Detailed setup / Sensor model is changed to another type, the following parameters are changed to new default values corresponding to the selected model :
Qnom, Mass flow unit, Mass flow LRV, Mass flow URV, Vol flow unit, Vol flow LRV,
Vol flow URV, Autozero range, Autozero fluctuation range and the sensor constants.
In this case the sensor constants, the detector serial number and, if available, the tag number must be set to the values corresponding to the used detector as described above.

3.23 Reading maximum fluid temperature (Detailed Set-up)

Fluid max. temp	The highest measured medium temperature ever reached can be read in this parameter. This parameter can not be reset or changed by the user.

IM 01R04B07-00E-E 3rd edition July 01, 2013-00

YOKOGAWA ELECTRIC CORPORATION
World Headquarters
9-32, Nakacho 2-chome, Musashino-shi
Tokyo 180-8750
Japan
www.yokogawa.com

YOKOGAWA CORPORATION OF AMERICA
2 Dart Road
Newnan GA 30265
USA
www.yokogawa.com/us

YOKOGAWA EUROPE B.V.
Euroweg 2
3825 HD AMERSFOORT
The Netherlands
www.yokogawa.com/eu

YOKOGAWA ELECTRIC ASIA Pte. LTD.
5 Bedok South Road
Singapore 469270
Singapore
www.yokogawa.com/sg

YOKOGAWA CHINA CO. LTD.
3F Tower D Cartelo Crocodile Building
No.568 West Tianshan Road Changing District
Shanghai, China
www.yokogawa.com/cn

YOKOGAWA MIDDLE EAST B.S.C.(c)
P.O. Box 10070, Manama
Building 577, Road 2516, Busaiteen 225
Muharraq, Bahrain
www.yokogawa.com/bh

Yokogawa has an extensive sales and distribution network.
Please refer to the European website (www.yokogawa.com/eu) to contact your nearest representative.

YOKOGAWA ◆

IM 01R04B07-00E-E 3rd edition July 01, 2013-00