

**Common Tables Specification**

## HCF\_SPEC-183, Revision 13.0

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# SCOPE

The *Common Tables Specification* is an Application Layer specification and, accordingly, builds on the Application Layer Requirements found in the *Command Summary Specification.* Conformance to all requirements of the *Command Summary Specification* is a prerequisite to conforming to this specification.

The *Common Tables Specification* contains a collection of standard lookup tables (e.g., Engineering Units, Manufacturer Identification Code, etc.) used throughout the Protocol. Commands defined by the HART Protocol and device-specific commands often reference these tables. When a Common Table is referenced by a command, the table or subset of the table must be used exactly as specified. Furthermore, undefined (i.e., unlisted) codes must not be used in any device.

In addition to listing Common Tables, this specification contains the rules that must be followed when modifying this specification, adding enumerations to an existing Common Table or defining new tables. As required by the *Command Summary Specification*, once a code has been defined, the term and its corresponding code (enumeration) must not be changed or deleted.

# REFERENCES

# HART Field Communications Protocol Specifications

These documents published by the HART Communication Foundation are referenced throughout this specification:

*HART Smart Communications Protocol Specification.* HCF\_SPEC-12

*Data Link Layer Specification.* HCF\_SPEC-81 *Command Summary Specification.* HCF\_SPEC-99 *Universal Command Specification.* HCF\_SPEC-127

*Common Practice Command Specification.* HCF\_SPEC-151

*Device Families Command Specification.* HCF\_SPEC-160

# DEFINTIONS

Terms used in this document and defined in *HART Field Communications Protocol Specification*

include Enumerations, Fixed Current Mode, Unit Code, Device Variable, Master, and Slave

# SPECIFICATION CONTROL

The Common Tables Specification is designed to allow the addition of new enumerations. These enumerations are applicable to all slave devices and may be updated frequently. As a result, the change control procedures used by other specifications do not apply to the Common Tables Specification. In other words, balloting of a new or revised Common Tables Specification is not practical.

This section defines procedures and requirements that govern the addition of a table to this specification. Therefore the modification of a table included in a revision of this specification. These requirements are designed to:

* Ensure the technical excellence of each table;
* Provide a fair, open and objective basis for the development of additional tables;
* Alignment of the tables with Protocol requirements and practices; and
* Allow access and participation by all interested parties.

Any changes to this specification, other than additions or changes to a specific table must follow the normal change procedures as defined in the *HART Smart Communications Protocol Specification*.

Common Tables Specification Revision 13.1 must be balloted and follow the normal process for HART Specifications as defined in *HART Field Communications Protocol Specification*.

# Revision Numbers

As per normal Protocol requirements, The *Common Tables Specification* has a major and minor revision number. As a specification is changed, the major and minor revision numbers are incremented as follows:

* + - The addition of a new table and/or new enumerations to existing tables is a functional change to this specification. The major revision number must be incremented and the minor revision number reset to one.
    - Minor changes to an enumeration label where the meaning does not change and/or corrections to misspelled words shall be considered a non-functional change to this specification and the minor revision number must be incremented.
    - Any other change to this specification must follow the revision numbering and change control procedures found in the HART Smart Communications Protocol Specification.

# Additions to Common Tables

Any HCF member company or the HCF staff may submit request proposals for the additions to the existing Common Tables. All Request proposals must state the tables affected, changes envisioned and the benefits the changes would provide.

All requests are maintained in a database. This database shall track who and how often specific enumerations are requested.

Note: The frequency of an enumeration request is one acceptance criteria used by the Common Tables Committee.

Proposals are forwarded to members of the Common Tables Committee for review. The Common Tables Committee may reject a proposal, modify the proposal or accept the proposal. Complete and accepted proposals are collected for inclusion in the next revision of the *Common Tables Specification*. Once the Request Proposal for a particular enumeration is approved, the actual numeric value for the enumeration is chosen by members of the Common Tables Committee.

## Additions to Common Table 8, Manufacturer Identification Codes

Any additions to Common Table 8, Manufacturer Identification Codes must be performed by the HCF Staff.

## Device Identification Code Registration

The owner of a Manufacturer ID may register his device types with the HCF and have them included in the *Common Tables Specification*. Requests for these additions to the specification are made following normal requirements and procedures. The assignment of device type codes must meet the following requirements:

* + - * The device type codes shall be assigned based on the rules specified in the *Data Link Layer Specification*.
      * All devices shall follow the revision rules in the *Command Summary Specification*.

## Engineering Unit Code Selection

When evaluating unit codes requests, the Common Tables Committee shall make assignments on the following criteria:

* Unit codes that are common to more than one Device Family and are approved for selection shall be assigned in the ranges from 1- 169 and 220 — 239.
* Unit codes that are Device Family specific and are approved for selection shall be assigned in the Unit Code Expansion areas of 170 — 219 for the appropriate Unit Code Expansion Table.
* The Unit Code Expansion Tables include all the existing enumerations from Table 2 (1 - 169 and 220 — 239) along with the Unit Code Expansion areas of 170 — 219.
* Unit codes from 240 — 249 are reserved for manufacturer specific definitions and mustnot be used in the assignment of Unit Codes.

# Releasing a Common Tables Specification Revision

Accepted change proposals are collected and periodically a new revision of the *Common Tables Specification* is generated. A new revision is (typically) released once or twice a year. The actual release must complete the following steps:

* + - A proposed revision of the Common Tables Specification is generated and all approved change proposals are incorporated.
    - The proposed revision is forwarded to all members of the Common Tables Committee for review and approval.
    - Once delivery of the proposed revision is confirmed, committee members have 15 working days to approve or disapprove the modifications. All rejections must include conditions for acceptance. No response will be considered approval by that committee member.
    - Unanimous approval by Common Tables Committee membership is required to release the

*Common Tables Specification* revision.

# Common Tables Committee

The Executive Committee of the HCF shall appoint the Common Tables Committee to control changes to this specification. The Common Tables Committee shall consist of three to four members. The member should have a minimum of 2 years work experience with the Application Layer of the Protocol. The Common Tables Committee shall:

* + - Review all proposed changes to the *Common Tables Specification*;
    - Ensure the *Common Tables Specification* change procedures are followed;
    - Determine Common Tables Specification advancement;
      * Document Committee actions; and
      * Verify the Common Tables Specification adheres to all requirements of the HART Protocol.

The Chair must keep accurate and complete records of all meetings, design decisions and discussions. The Chair is responsible for publishing meeting minutes. All e-mail and other correspondence must be archived and available to the HCF membership. Common Tables Committee actions may not be implemented prior to the publication of the meeting minutes documenting the action being published to the HCF membership.

# COMMON TABLES

The following sections list the enumerations for each of the common tables.

# Table 1. Device Type Codes

Table 1.xx (where xx denotes the manufacturer number in decimal), defines the device types enumerations of devices.

Any enumerations in the range from 250-255 are not allowable. Any enumeration not covered is Undefined .

## Table 1.03 Ametek Device Type Codes

**Code Description Notes**

4 NEWTHERMOX

## Table 1.10 Brooks Instrument Device Type Codes

**Code Description Notes**

* + - 1. TRI20
      2. 38XXVA
      3. 99XXOVAL

## Table 1.14 Delta Device Type Codes

**Code Description Notes**

1 HT

## Table 1.17 Endress & Hauser Device Type Codes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Code** | **Description** | **Notes** | **Code** | **Description** | **Notes** |
| 3 | FMU860 |  | 50 | PROMAG33 |  |
| 4 | FMU861 |  | 51 | PROWIRL70 |  |
| 5 | FMU862 |  | 52 | PROMASS63 |  |
| 6 | FMR130/Micropilot |  | 53 | PROMAG39 |  |
| 7 | CERABS /Cerabar S |  | 54 | PROMAG35S |  |
| 8 | FEC12 |  | 55 | PROWIRL77 |  |
| 9 | DELTBS/Deltabar S |  | 57 | PROMASS60 |  |
| 10 | FMU231/Prosonic T |  | 64 | PROSON F |  |
| 11 | DELTAPS/ Deltapilot |  | 65 | PROMAG50 |  |
| 12 | FMR23X |  | 66 | PROMAG53 |  |
| 13 | FMP200 |  | 70 | PROMAG23 |  |
| 14 | Cerabar M |  | 121 | TMD833 |  |
| 15 | FMR2xx |  | 124 | TMD842 |  |
| 16 | FMR53x |  | 140 | MyPro pH |  |
| 80 | PROMASS80 |  | 141 | MyPro LFC |  |
| 81 | PROMASS83 |  | 142 | MyPro LFI |  |
| 83 | PROMASS40 |  | 181 | NMT530 |  |
| 100 | AT70 |  | 200 | TMT182 |  |
| 120 | TMD832 |  |  |  |  |

* + 1. **Table 1.18 Elsag Bailey Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 7 | 50XM2000 |  |
| 8 | 50XE4000 |  |
| 14 | 50VT1000 |  |
| 15 | 50VM1000 |  |
| 25 | 50XM1000 |  |
| 26 | 50SM1000 |  |
| 66 | PTH |  |
| 80 | TB82PH\_pH |  |
| 81 | TB82PH\_ORP |  |
| 82 | TB82PH\_pION |  |
| 83 | TB82PH\_IConc |  |
| 84 | TB82EC\_COND |  |
| 85 | TB82EC\_CONC |  |
| 86 | TB82TE\_COND |  |
| 87 | TB82TE\_CONC |  |
| 88 | TB82TC\_COND |  |
| 89 | TB82TC\_CONC |  |

* + 1. **Table 1.20 Foxboro Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 41 | IMT25 |  |
| 46 | 1/A\_PRESSURE |  |
| 51 | TVORTEX/183  Vortex IT |  |

* + 1. **Table 1.21 Fuji Device Type Codes**

**Code Description Notes**

1 FCX

## Table 1.22 ABB Automation Device Type Codes

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 3 | TEU 471 |  |
| 4 | TEU 421 |  |
| 5 | TEU 211 |  |
| 6 | TS 11 |  |
| 8 | TH 02 |  |
| 64 | TZID |  |
| 65 | TZIDC |  |
| 133 | AS800 |  |

* + 1. **Table 1.23 Honeywell Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 1 | ST3000 |  |
| 2 | STT25T |  |
| 3 | HWFLOW/Mage W Plus |  |
| 4 | STT25H |  |

* + 1. **Table 1.25 Kay Ray Sensall Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 8 | level 4050 |  |
| 9 | density 3680 |  |
| 10 | 4790 |  |
| 15 | steam quality 3280 |  |

* + 1. **Table 1.26 ABB Automation Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 1 | KSX |  |
| 2 | 600T |  |
| 8 | KST |  |
| 10 | 658T |  |
| 12 | 652/653S |  |

* + 1. **Table 1.31 Micro Motion Device Type Codes**

**Code Description Notes**

7 RFT9712

20 RFT9720

21 RFT9739

30 9701

42 Series 2000

## Table 1.32 Moore Industries Device Type Codes

**Code Description Notes**

1 TRZ

3 THZ

## Table 1.33 Moore Products Device Type Codes

**Notes**

|  |  |
| --- | --- |
| **Code** | **Description** |
| 1 | 340 A |
| 2 | 340\_B |
| 3 | 344 |
| 5 | 341 |
| 6 | 340 A2 |
| 8 | 340 B2 |
| 9 | 344 2 |
| 10 | 340\_S |
| 11 | 343 |
| 12 | 760D Valvepac |
| 13 | 345 |

## Table 1.38 Rosemount Device Type Codes

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Code** | **Description** | **Notes** | **Code** | **Description** |  | **Notes** |
| 1 | pressure 3051 |  | 23 | temperature | 544 |  |
| 2 | temperature 3044 |  | 24 | temperature | 644 |  |
| 3 | pressure 1151s |  | 25 | temperature | 3144 |  |
| 4 | mag flow 8712 |  | 26 | temperature | 3244 |  |
| 5 | pressure 2001 |  | 27 | level 3700 |  |  |
| 6 | pressure 3051c |  | 28 | level 3750 |  |  |
| 7 | mass flow 9712 | 1 | 29 | TRI LOOP |  |  |
| 8 | level 4050 | 2 | 30 | c 3095 |  |  |
| 9 | density 3680 | 2 | 31 | mm 3095 |  |  |
| 10 | ph 1054 | 3 | 32 | tank 3701 |  |  |
| 11 | pressure 30011 |  | 33 | level 3300 |  |  |
| 12 | mag flow 8712H |  | 34 | asu 3702 |  |  |
| 13 | temperature 3044C |  | 35 | pressure 2088s | | |
| 14 | pressure 3001c |  | 36 | probar | | |
| 15 | pressure 3051clp |  | 37 | massprobar | | |
| 16 | vortex flow 8800 |  | 38 | prov | | |
| 17 | htg 3201 |  | 39 | pressure 2090s | | |
| 18 | pressure 1152s |  | 40 | probar UC | | |
| 19 | htg 3202 |  | 41 | 2055D | | |
| 20 | pressure 3001s |  | 42 | 3095PV | | |
| 21 | multi 3095FT |  | 45 | Sentry | | |
| 22 | mv 3095 |  | 47 | ProPlate UC | | |

**Notes**

1. VARIABLE micro\_motion\_model\_code 7, mass\_flow\_9712, implemented in HART Revision 4 when there was no VARIABLE company\_identification\_code, so 7 must be kept as Reserved for this place holder.
2. VARIABLE kayray\_model\_code 8, level\_4050, and 9, density\_3680, were implemented in HART Revision 4 when there was no VARIABLE company\_identification\_code, so 8 and 9 must be kept as Reserved for this place holder.
3. VARIABLE rosemount\_analytical\_model\_code 10, ph\_1054, were implemented in HART Revision 4 when there was no VARIABLE company\_identification\_code, so 10 must be kept as Reserved for this place holder.

## Table 1.39 Peek Measurement Device Type Codes

**Code Description Notes**

0 900 Densitometer

## Table 1.40 Schlumberger Device Type Codes

**Code Description Notes**

1 NEXGEN

## Table 1.42 Siemens Device Type Codes

**Code Description Notes**

1. MICRO\_K
2. SITRANS\_L
3. SIPAN\_PH
4. SITRANS\_F
5. SIPAN\_LF
6. SIPAN\_O2
7. SITRANS\_LR
8. SITRANS\_P\_HS
9. SITRANS\_P\_DS
10. SITRANS\_P\_ES
11. SITRANS\_P\_MS
12. SITRANS\_T\_2K
13. SITRANS\_TW

18 SITRANS\_TK\_H

21 SIPART\_PS2

## Table 1.44 Toshiba Device Type Codes

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 2 | AP3100 |  |
| 3 | AP3110 |  |
| 4 | AP3120 |  |
| 5 | AP3140 |  |
| 6 | AP3150 |  |
| 7 | AP3170 |  |
| 8 | AP3180 |  |
| 9 | AP3190 |  |
| 10 | LF220 |  |

* + 1. **Table 1.46 Rosemount Analytical Device Type Codes**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Code** | **Description** | **Notes** | **Code** | **Description** | **Notes** |
| 6 | ph 1181 |  | 20 | 3081-81pH |  |
| 7 | conductivity 1181 |  | 21 | 3081-81C |  |
| 10 | ph 1054 |  | 22 | 3081-81con |  |
| 11 | conductivity 1054 |  | 23 | 3081-81T |  |
| 12 | Oxymitter 4000 |  | 80 | 54pH/ORP |  |
| 14 | 3081FG |  | 81 | 54eC |  |
| 15 | OPM-2000R |  | 82 | 52epH/ORP |  |
| 16 | OCX-4000 |  | 83 | 54eA |  |

* + 1. **Table 1.47 Metso Automation Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 1 | PSMART |  |
| 60 | SMARTPULP |  |
| 62 | MCAi |  |

* + 1. **Table 1.48 Flowserve Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 1 | Logix 12xx |  |
| 2 | K mmer C2100 |  |
| 3 | Logix 500 |  |

* + 1. **Table 1.50 Viatran Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 1 | 970 |  |
| 46 | I/A Pressure |  |

* + 1. **Table 1.54 Yamatake Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 1 | YHWFLOW |  |
| 2 | ST3000 |  |
| 4 | Thermonex ATT |  |
| 5 | PTG |  |

* + 1. **Table 1.55 Yokogawa Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 1 | YEWFLO |  |
| 2 | YT200 |  |
| 3 | UNICOM |  |
| 4 | EJA |  |
| 5 | ADMAG\_AE |  |
| 6 | AM11 |  |
| 8 | ADMAG\_SE |  |
| 9 | YTA |  |
| 10 | YTA70E |  |
| 11 | DYF |  |
| 12 | ZR202 |  |
| 13 | ZR402 |  |
| 21 | PH202 |  |
| 22 | SC202 |  |
| 64 | ROTAMASS |  |

* + 1. **Table 1.59 Meggitt Mobrey Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 19 | 4301 |  |
| 20 | 3301 |  |
| 21 | MSP 100 |  |
| 41 | MLT 100 |  |

* + 1. **Table 1.61 Princo Device Type Codes**

**Code Description Notes**

1 L4610

## Table 1.62 Smar Device Type Codes

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 1 | LD301 |  |
| 2 | TT301 |  |

* + 1. **Table 1.63 Foxboro Eckardt Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 1 | TSV175 |  |
| 2 | DMU 130 |  |
| 3 | TI/RTT20 |  |
| 4 | SRD 991 |  |
| 5 | DMU 140 |  |

* + 1. **Table 1.66 Samson Device Type Codes**

**Code Description Notes**

249 3780

## Table 1.67 Sparling Instruments Device Type Codes

**Code Description Notes**

238 FM6XX

## Table 1.69 Krohne Device Type Codes

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 236 | BM102 |  |
| 237 | VFM31 |  |
| 242 | ESKII |  |
| 243 | IFC110 |  |
| 244 | IFC090 |  |
| 245 | UFC500 |  |
| 246 | IFC010 |  |
| 247 | MFC08x |  |
| 248 | IFC080 |  |
| 249 | BM70 |  |

* + 1. **Table 1.77 Westlock Controls Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 1 | ICOT |  |
| 2 | SmartCal |  |

* + 1. **Table 1.78 Drexelbrook Device Type Codes**

**Code Description Notes**

2 UNIVERSAL III

## Table 1.79 Saab Tank Control Device Type Codes

**Code Description Notes**

239 TankRadarPro

## Table 1.80 K-TEK Device Type Codes

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 103 | SPM100 Level |  |
| 114 | AT100/200 Lvl  Vol LCD |  |
| 115 | AT100/200 2Lvl  Vol LCD |  |
| 118 | AT100/200 Lvl  Temp Vol LCD |  |
| 119 | AT100/200 2Lvl  Temp Vol LCD |  |
| 120 | AT100/200 Lvl |  |
| 122 | AT100/200 Lvl LCD |  |
| 123 | AT100/200 2Lvl LCD |  |
| 126 | AT100/200 Lvl  Temp LCD |  |
| 127 | AT100/200 2Lvl  Temp LCD |  |
| 152 | MT2000  Microwave Level |  |
| 203 | SPM200 Level |  |

* + 1. **Table 1.82 Draeger Device Type Codes**

**Code Description Notes**

237 POLYTRON2 IR

**Code Description Notes**

247 POLYTRON2

## Table 1.84 Siemens Milltronics PI Device Type Codes

**Code Description Notes**

249 MST9500

## Table 1.86 Magnetrol Device Type Codes

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 235 | Model 705 2.x |  |
| 236 | Model 708 |  |
| 237 | Model 805 |  |
| 238 | Model 705 |  |
| 239 | SMARTEZ |  |

* + 1. **Table 1.87 Metso Automation Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 238 | ND800\_PT |  |
| 239 | ND800 |  |

* + 1. **Table 1.88 Milltronics Device Type Codes**

**Code Description Notes**

200 86x PROBE

## Table 1.90 Anderson Instrument Company Device Type Codes

**Code Description Notes**

200 ANDRSN1

## Table 1.91 Inor Device Type Codes

**Code Description Notes**

239 MESO

## Table 1.92 Robertshaw Device Type Codes

**Code Description Notes**

200 Excalibur 7000

## Table 1.94 Accutech Device Type Codes

**Code Description Notes**

239 AI1500

## Table 1.96 Kamstrup Device Type Codes

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 238 | FLEXBAR HRT |  |
| 239 | FLEXTOP HRT |  |

* + 1. **Table 1.97 Knick Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 232 | 2211 CondI |  |
| 234 | 2211 Cond |  |
| 235 | 2211 Ph |  |

* + 1. **Table 1.101 Masoneilan-Dresser Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 100 | HDLT |  |
| 200 | SVI |  |

* + 1. **Table 1.102 Besta Device Type Codes**

**Code Description Notes**

239 CLS 4-20

## Table 1.103 Ohmart Device Type Codes

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 224 | DSTH/LSTH |  |
| 225 | DSTH/LSTH Comp |  |

* + 1. **Table 1.104 Harold Beck and Sons Device Type Codes**

**Code Description Notes**

1 ESR-D

## Table 1.107 Wika Device Type Codes

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 238 | UniTrans |  |
| 239 | T 32 |  |

* + 1. **Table 1.108 Bopp & Reuther Heinrichs Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 235 | UMC2 |  |
| 236 | ES |  |
| 237 | VTX |  |
| 239 | UST 1 |  |

* + 1. **Table 1.109 PR Electronics Device Type Codes**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 238 | PRetrans 6335 |  |
| 239 | Pretop 5335 |  |

* + 1. **Table 1.113 Apparatebau Hundsbach Device Type Codes**

**Code Description Notes**

238 MT115

## Table 1.114 Dynisco Device Type Codes

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 223 | IPXII |  |
| 224 | IPX |  |

* + 1. **Table 1.116 Direct Measurement Device Type Codes**

**Code Description Notes**

239 DMC R-1A

## Table 1.120 Buerkert Fluid Control Systems Device Type Codes

**Code Description Notes**

239 8630

## Table 1.124 GLI Device Type Codes

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 238 | M33-53P |  |
| 239 | M33-53C |  |

* + 1. **Table 1.126 Paper Machine Components Device Type Codes**

**Code Description Notes**

224 SMT-EL

## Table 1.127 Labom Device Type Codes

**Code Description Notes**

60 PASCAL CI

224 IPX

## Table 1.129 Turbo Device Type Codes

**Code Description Notes**

127 Intermag-Transmag

## Table 1.131 SMC Device Type Codes

**Code Description Notes**

239 F793-E701

## Table 1.132 Status Instruments Device Type Codes

**Code Description Notes**

239 SEM 300

## Table 1.133 Huakong Device Type Codes

**Code Description Notes**

127 HK TT01

## Table 1.135 Vortek Instruments, LLC Device Type Codes

**Code Description Notes**

1 Innova-Mass

## Table 1.137 Action Instruments Device Type Codes

**Code Description Notes**

239 T798

## Table 1.140 Magtech Device Type Codes

**Code Description Notes**

136 LTM-100

## Table 1.141 Rueger Device Type Codes

**Code Description Notes**

1 S95 HRT

## Table 1.144 TN Technologies Device Type Codes

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Notes** |
| 125 | NDMi |  |
| 126 | Accu-Wave |  |
| 127 | NCMi |  |

* + 1. **Table 1.145 Dezurik Device Type Codes**

**Code Description Notes**

239 Positioner

## Table 1.147 Welltech Device Type Codes

**Code Description Notes**

124 WT2000

## Table 1.154 Milton Roy Co. Device Type Codes

**Code Description Notes**

127 P Series

## Table 1.155 PMV Device Type Codes

**Code Description Notes**

211 D3

## Table 1.156 Turck Device Type Codes

**Code Description Notes**

1 KMU-HLI

# Table 2. Engineering Unit Codes

This table is included to maintain backward compatibility with HART Revision 5 and earlier. For HART 6, please refer to the expansion tables below. Actual text display of these codes is host dependent.

The enumerations range from 1- 169 and 220 — 239

# Temperature

## Unit

**Code Description Note**

1. Degrees Celsius
2. Degrees Fahrenheit
3. Degrees Rankine
4. Kelvin

# Pressure

## Unit

**Code Description Note**

1. inches of water at 68 degrees F
2. inches of mercury at 0 degrees C
3. feet of water at 68 degrees F
4. millimeters of water at 68 degrees F
5. millimeters of mercury at 0 degrees C
6. pounds per square inch
7. bars
8. millibars
9. **grams per square centimeter**
10. **kilograms per square centimeter**
11. **pascals**
12. **kilopascals**
13. **torr**
14. atmospheres

145 inches of water at 60 degrees F

237 megapascals

# Pressure

## Unit

**Code Description Note**

1. inches of water at 4 degrees C
2. millimeters of water at 4 degrees C

# Volumetric Flow

## Unit

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Note** |
| 15 | cubic feet per minute |  |
| 16 | gallons per minute |  |
| 17 | liters per minute |  |
| 18 | imperial gallons per minute |  |
| 19 | cubic meter per hour |  |
| 22 | gallons per second |  |
| 23 | million gallons per day |  |
| 24 | liters per second |  |
| 25 | million liters per day |  |
| 26 | cubic feet per second |  |
| 27 | cubic feet per day |  |
| 28 | cubic meters per second |  |
| 29 | cubic meters per day |  |
| 30 | imperial gallons per hour |  |
| 31 | imperial gallons per day |  |
| 121 | normal cubic meter per hour | MKS System |
| 122 | normal liter per hour | MKS System |
| 123 | standard cubic feet per minute | U.S. System |
| 130 | cubic feet per hour |  |
| 131 | cubic meters per minute |  |
| 132 | barrels per second | 1 barrel equals 42 U.S. gallons |
| 133 | barrels per minute | 1 barrel equals 42 U.S. gallons |
| 134 | barrels per hour | 1 barrel equals 42 U.S. gallons |
| 135 | barrels per day | 1 barrel equals 42 U.S. gallons |

**Volumetric Flow**

**Unit**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Note** |
| 136 | gallons per hour |  |
| 137 | imperial gallons per second |  |
| 138 | liters per hour |  |
| 235 | gallons per day |  |

**Velocity**

**Unit**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Note** |
| 20 | feet per second |  |
| 21 | meters per second |  |
| 114 | inches per second |  |
| 115 | inches per minute |  |
| 116 | feet per minute |  |
| 120 | meters per hour |  |

**Volume**

**Unit**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Note** |
| 40 | gallons |  |
| 41 | liters |  |
| 42 | imperial gallons |  |
| 43 | cubic meters |  |
| 46 | barrels | 1 barrel equals 42 U.S. gallons |
| 110 | bushels |  |
| 111 | cubic yards |  |
| 112 | cubic feet |  |
| 113 | cubic inches |  |
| 124 | bbl liq | 1 liquid barrel equals 31.5 U.S. gallons |

**Volume**

**Unit**

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Note** |
| 166 | normal cubic meter | MKS System |
| 167 | normal liter | MKS System |
| 168 | standard cubic feet | U.S. System |
| 236 | hectoliters |  |

**Length**

**Unit**

**Code Description Note**

1. feet
2. meters
3. inches
4. centimeters
5. millimeters

# Time

## Unit

**Code Description Note**

1. minutes
2. seconds
3. hours
4. days

# Mass

## Unit

**Code Description Note**

1. grams
2. kilograms

# Mass

## Unit

**Code Description Note**

1. metric tons
2. pounds
3. short tons
4. long tons

125 ounce

# Mass Flow

## Unit

**Code Description Note**

1. grams per second
2. grams per minute
3. grams per hour
4. kilograms per second
5. kilograms per minute
6. kilograms per hour
7. kilograms per day
8. metric tons per minute
9. metric tons per hour
10. metric tons per day
11. pounds per second
12. pounds per minute
13. pounds per hour
14. pounds per day
15. short tons per minute
16. short tons per hour
17. short tons per day
18. long tons per hour
19. long tons per day

# Mass per Volume

## Unit

**Code Description Note**

1. specific gravity units
2. grams per cubic centimeter
3. kilograms per cubic meter
4. pounds per gallon
5. pounds per cubic foot
6. grams per milliliter
7. kilograms per liter
8. grams per liter
9. pounds per cubic inch
10. short tons per cubic yard 100 degrees twaddell
11. degrees baume heavy
12. degrees baume light
13. degrees API
14. micrograms per liter
15. micrograms per cubic meter

# Viscosity

## Unit

**Code Description Note**

1. centistokes
2. centipoise

# Electromagnetic Unit of Electric Potential

## Unit

**Code Description Note**

36 millivolts

58 volts

# Electrostatic Unit of Current

## Unit

**Code Description Note**

39 milliamperes

# Electromagnetic Unit of Resistance

## Unit

**Code Description Note**

37 ohms

163 kohms

# Energy (includes Work)

## Unit

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Note** |
| 69 | newton meter |  |
| 89 | deka therm |  |
| 126 | foot pound force |  |
| 128 | kilo watt hour |  |
| 162 | mega calorie | 1 calorie = 4.184 Joules |
| 164 | mega joule |  |
| 165 | british thermal unit | 1Btu=0.2519958kcal Energy |

**Power**

**Unit**

**Code Description Note**

127 kilo watt

129 horsepower

1. mega calorie per hour 1 calorie = 4.184 Joules
2. mega joule per hour
3. british thermal unit per hour 1Btu=0.2519958kcal Energy

# Radial Velocity

## Unit

**Code Description Note**

1. degrees per second
2. revolutions per second
3. revolutions per minute

# Miscellaneous

## Unit

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Note** |
| 38 | hertz |  |
| 56 | microsiemens |  |
| 57 | percent |  |
| 59 | pH |  |
| 66 | milli siemens per centimeter |  |
| 67 | micro siemens per centimeter |  |
| 68 | newton |  |
| 101 | degrees brix |  |
| 105 | percent solids per weight |  |
| 106 | percent solids per volume |  |
| 107 | degrees balling |  |
| 108 | proof per volume |  |
| 109 | proof per mass |  |
| 139 | parts per million |  |
| 143 | degrees |  |
| 144 | radian |  |
| 148 | percent consistency |  |
| 149 | volume percent |  |
| 150 | percent steam quality |  |
| 151 | feet in sixteeenths | See Note 1 Below |
| 152 | cubic feet per pound |  |
| 153 | picofarads |  |

**Miscellaneous**

**Unit**

**Code Description Note**

* 1. mililiters per liter
  2. microliters per liter

1. percent plato
2. percent lower explosion level

169 parts per billion

## Note

1. There must be 6 digits to the left of the decimal point of the associated numeric value. The format of the most significant two of these digits indicate the number of feet . The adjacent two lesser significant digits indicate the number of additional sixteenths (i.e., 16 sixteenths = 1 inch). If the numeric value is in the floating point format, any digits to the right of the decimal point are discarded by the host.

# Generic

## Unit

**Code Description Note**

240- Enumeration may be used for

manufacturer specific definitions

1. Not Used
2. None
3. Unknown
4. Special

Tables 2.64 through 2.90 are the Engineering Unit Code Expansion tables. They include all the existing enumerations from Table 2 (1 - 169 and 220 —239) along with the Unit Code Expansion areas of 170 — 219

## Table 2.64 Temperature Unit Codes

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

## Unit

**Code Description Note**

1. Degrees Celsius
2. Degrees Fahrenheit
3. Degrees Rankine
4. Kelvin

## Table 2.65 Pressure Unit Codes

This is an Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

|  |  |  |
| --- | --- | --- |
| **Unit Code** | **Description** | **Note** |
| 1 | inches of water at 68 degrees F |  |
| 2 | inches of mercury at 0 degrees C |  |
| 3 | feet of water at 68 degrees F |  |
| 4 | millimeters of water at 68 degrees F |  |
| 5 | millimeters of mercury at 0 degrees C |  |
| 6 | pounds per square inch |  |
| 7 | bars |  |
| 8 | millibars |  |
| 9 | grams per square centimeter |  |
| 10 | kilograms per square centimeter |  |
| 11 | pascals |  |
| 12 | kilopascals |  |
| 13 | torr |  |
| 14 | atmospheres |  |
| 145 | inches of water at 60 degrees F |  |
| 170 | centimeters of water at 4 degrees C |  |
| 171 | meters of water at 4 degrees C |  |
| 172 | centimeters of mercury at 0 degrees C |  |
| 173 | pounds per square foot |  |
| 174 | hectoPascals |  |
| 175 | pounds per square inch absolute |  |
| 176 | kilograms per square meter |  |
| 177 | feet water 4 degrees C |  |
| 178 | feet water at 60 degrees F |  |
| 179 | meters of mercury at 0 degrees C |  |
| 237 | megapascals |  |
| 238 | inches of water at 4 degrees C |  |
| 239 | millimeters of water at 4 degrees C |  |

## Table 2.66 Volumetric Flow Unit Codes

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

|  |  |  |
| --- | --- | --- |
| **Unit Code** | **Description** | **Note** |
| 15 | cubic feet per minute |  |
| 16 | gallons per minute |  |
| 17 | liters per minute |  |
| 18 | imperial gallons per minute |  |
| 19 | cubic meter per hour |  |
| 22 | gallons per second |  |
| 23 | million gallons per day |  |
| 24 | liters per second |  |
| 25 | million liters per day |  |
| 26 | cubic feet per second |  |
| 27 | cubic feet per day |  |
| 28 | cubic meters per second |  |
| 29 | cubic meters per day |  |
| 30 | imperial gallons per hour |  |
| 31 | imperial gallons per day |  |
| 121 | normal cubic meter per hour | MKS System |
| 122 | normal liter per hour | MKS System |
| 123 | standard cubic feet per minute | U.S. System |
| 130 | cubic feet per hour |  |
| 131 | cubic meters per minute |  |
| 132 | barrels per second | 1 barrel equals 42 U.S. gallons |
| 133 | barrels per minute | 1 barrel equals 42 U.S. gallons |
| 134 | barrels per hour | 1 barrel equals 42 U.S. gallons |
| 135 | barrels per day | 1 barrel equals 42 U.S. gallons |
| 136 | gallons per hour |  |
| 137 | imperial gallons per second |  |
| 138 | liters per hour |  |
| 235 | gallons per day |  |

## Table 2.67 Velocity Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

## Unit

**Code Description Note**

* 1. feet per second
  2. meters per second

1. inches per second
2. inches per minute
3. feet per minute

120 meters per hour

## Table 2.68 Volume Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

|  |  |  |
| --- | --- | --- |
| **Unit Code** | **Description** | **Note** |
| 40 | gallons |  |
| 41 | liters |  |
| 42 | imperial gallons |  |
| 43 | cubic meters |  |
| 46 | barrels | 1 barrel equals 42 U.S. gallons |
| 110 | bushels |  |
| 111 | cubic yards |  |
| 112 | cubic feet |  |
| 113 | cubic inches |  |
| 124 | bbl liq | 1 liquid barrel equals 31.5 U.S. gallons |
| 166 | normal cubic meter | MKS System |
| 167 | normal liter | MKS System |
| 168 | standard cubic feet | U.S. System |
| 236 | hectoliters |  |

## Table 2.69 Length Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

|  |  |  |
| --- | --- | --- |
| **Unit Code** | **Description** | **Note** |
| 44 | feet |  |
| 45 | meters |  |
| 47 | inches |  |
| 48 | centimeters |  |
| 49 | millimeters |  |
| 151 | feet in sixteeenths | See Note 1 Above |

## Table 2.70 Time Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

## Unit

**Code Description Note**

1. minutes
2. seconds
3. hours
4. days

## Table 2.71 Mass Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

## Unit

**Code Description Note**

1. grams
2. kilograms
3. metric tons
4. pounds
5. short tons
6. long tons

125 ounce

## Table 2.72 Mass Flow Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

## Unit

**Code Description Note**

1. grams per second
2. grams per minute
3. grams per hour
4. kilograms per second
5. kilograms per minute
6. kilograms per hour
7. kilograms per day
8. metric tons per minute
9. metric tons per hour
10. metric tons per day
11. pounds per second
12. pounds per minute
13. pounds per hour
14. pounds per day
15. short tons per minute
16. short tons per hour
17. short tons per day
18. long tons per hour
19. long tons per day

## Table 2.73 Mass per Volume Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

## Unit

**Code Description Note**

1. specific gravity units
2. grams per cubic centimeter
3. kilograms per cubic meter
4. pounds per gallon
5. pounds per cubic foot
6. grams per milliliter
7. kilograms per liter
8. grams per liter
9. pounds per cubic inch
10. short tons per cubic yard 100 degrees twaddell
11. degrees baume heavy
12. degrees baume light
13. degrees API
14. micrograms per liter
15. micrograms per cubic meter
16. percent consistency

## Table 2.74 Viscosity Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

## Unit

**Code Description Note**

1. centistokes
2. centipoise

## Table 2.75 Angular Velocity Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

## Unit

**Code Description Note**

* 1. degrees per second
  2. revolutions per second
  3. revolutions per minute

## Table 2.76 Area Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

## Unit

**Code Description Note**

* + 1. **Table 2.77 Energy (Work) Unit Code**

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

|  |  |  |
| --- | --- | --- |
| **Unit Code** | **Description** | **Note** |
| 69 | newton meter |  |
| 89 | deka therm |  |
| 126 | foot pound force |  |
| 128 | kilo watt hour |  |
| 162 | mega calorie | 1 calorie = 4.184 Joules |
| 164 | mega joule |  |
| 165 | british thermal unit | 1Btu=0.2519958kcal Energy |

## Table 2.78 Force Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

## Unit

**Code Description Note**

68 newton

## Table 2.79 Power Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

|  |  |  |
| --- | --- | --- |
| **Unit Code** | **Description** | **Note** |
| 127 | kilo watt |  |
| 129 | horsepower |  |
| 140 | mega calorie per hour | 1 calorie = 4.184 Joules |
| 141 | mega joule per hour |  |
| 142 | british thermal unit per hour | 1Btu=0.2519958kcal Energy |

## Table 2.80 Frequency Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

## Unit

**Code Description Note**

38 hertz

## Table 2.81 Analytical Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

|  |  |  |
| --- | --- | --- |
| **Unit Code** | **Description** | **Note** |
| 57 | percent |  |
| 59 | pH |  |
| 150 | percent steam quality |  |
| 160 | percent plato |  |
| 161 | percent lower explosion level |  |

## Table 2.82 Capacitance Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

|  |  |  |
| --- | --- | --- |
| **Unit Code** | **Description** | **Note** |
| 153 | picofarads |  |

## Table 2.83 EMF Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

|  |  |  |
| --- | --- | --- |
| **Unit Code** | **Description** | **Note** |
| 36 | millivolts |  |
| 58 | volts |  |

## Table 2.84 Current Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

|  |  |  |
| --- | --- | --- |
| **Unit Code** | **Description** | **Note** |
| 39 | milliamperes |  |

## Table 2.85 Resistance Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

|  |  |  |
| --- | --- | --- |
| **Unit Code** | **Description** | **Note** |
| 37 | ohms |  |
| 163 | kohms |  |

## Table 2.86 Angle Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

|  |  |  |
| --- | --- | --- |
| **Unit Code** | **Description** | **Note** |
| 143 | degrees |  |
| 144 | radian |  |

## Table 2.87 Conductance Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

|  |  |  |
| --- | --- | --- |
| **Unit Code** | **Description** | **Note** |
| 56 | microsiemens |  |
| 66 | milli siemens per centimeter |  |
| 67 | micro siemens per centimeter |  |

## Table 2.88 Volume per Volume Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

|  |  |  |
| --- | --- | --- |
| **Unit Code** | **Description** | **Note** |
| 149 | volume percent |  |
| 154 | mililiters per liter |  |
| 155 | microliters per liter |  |

## Table 2.89 Volume per Mass Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

## Unit

**Code Description Note**

107 degrees balling

152 cubic feet per pound

## Table 2.90 Concentration Unit Code

This is a Engineering Unit Code Expansion Table that may only be used by Field Devices compatible with Revision 6 or later of the *HART Field Communications Protocol Specification*.

## Unit

**Code Description Note**

101 degrees brix

1. percent solids per weight
2. percent solids per volume
3. proof per volume
4. proof per mass

139 parts per million

169 parts per billion

# Table 3. Transfer Function Codes

|  |  |  |
| --- | --- | --- |
| **Code** | **Transfer FunctionDescription** | **Note** |
| 0 | Linear | Equation y=mx+b |
| 1 | Square Root | Equation y=sqrt(x) |
| 2 | Square Root Third Power | Equation y=sqrt(x^3) |
| 3 | Square Root Fifth Power | Equation y=sqrt(x^5) |
| 4 | Special Curve |  |
| 5 | Square | Equation y=x^2 |
| 230 | Discrete (Switch) | Binary (on/off) |
| 231 | Square Root Plus Special Curve | Do Not Use - See Note 1 |
| 232 | Square Root Third Power Plus Special Curve | Do Not Use - See Note 1 |
| 233 | Square Root Fifth Power Plus Special Curve | Do Not Use - See Note 1 |
| 240-249 | Enumeration May Be Used For Manufacturer Specific Definitions |  |
| 250 | Not Used |  |
| 251 | None |  |
| 252 | Unknown |  |
| 253 | Special |  |

Note: Codes 231-233 are only listed in the Table for backward compatibility. These Codes should not be used in new devices. Since these codes allow the use of a "special curve", their meaning is not consistent when used in different devices.

# Table 4. Material Codes

The materials in this table should be solids at 72 Degrees Fahrenheit

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Material Code** | **Description** | **Notes** | **Material Code** | **Description Notes** |
| 0 | Carbon Steel |  | 24 | Kynar 4 |
| 1 | Stainless Steel 304 |  | 25 | Aluminium |
| 2 | Stainless Steel 316 |  | 26 | Nickel |
| 3 | Hastelloy C |  | 27 | FEP 5 |
| 4 | Monel |  | 28 | Stainless Steel 316 Ti |
| 5 | Tantalum |  | 30 | Hastelloy C276 |
| 6 | Titanium |  | 31 | Klinger C4401 |
| 7 | Pt Ir |  | 32 | Thermotork |
| 8 | Alloy 20 |  | 33 | Grafoil |
| 9 | Co Cr Ni |  | 34 | PTFE Coated 316l Sst |
| 10 | PTFE |  | 35 | Gold Plated Hastelloy C276 |
| 11 | Vito |  | 36 | PTFE Glass |
| 12 | Buna N |  | 37 | PTFE Graphite |
| 13 | Ethyl Prop |  | 38 | Aflas |
| 14 | Urethane |  | 234 | PTFE Hastelloy |
| 15 | Gold Monel |  | 235 | Stainless Steel CF 8M |
| 16 | Tefzel |  | 236 | Hastelloy Nitrile SST |
| 17 | Ryton | 1 | 237 | Gold Plated SST |
| 18 | Ceramic |  | 239 | Monel 400 |
| 19 | Stainless Steel 316L |  | 240-249 | Enumeration May Be Used For Manufacturer Specific Definitions |
| 20 | PVC |  | 250 | Not Used |
| 21 | Nitrile Rubber |  | 251 | None |
| 22 | Kalrez | 2 | 252 | Unknown |
| 23 | Inconel | 3 | 253 | Special |

## Notes

1. Ryton is a registered trademark of Phillips Petroleum Company.
2. Teflon and Kalrez are registered trademarks of E. I. DuPont De Nemours Company.
3. Inconel is a trademark of International Nickel Company.
4. Kynar is a trademark of Pennwalt Incorporated. Hastelloy C is a trademark of Cabot Corporation.
5. Typically a sealing material for O-Ring

# Table 5. NULL

* 1. **Table 6. Alarm Selection Codes**

These apply to the alarm state of the physical output of an Analog Output

## Code Alarm Selection Description

1. High
2. Low

239 Hold Last Output Value

240-249 Enumeration May Be Used For

Manufacturer Specific Definitions

1. Not Used
2. None
3. Unknown
4. Special

# Table 7. Write Protect Codes

## Code Write Protect Description

1. No - Not Write Protected
2. Yes - Write Protected

240-249 Enumeration May Be Used For

Manufacturer Specific Definitions

1. Not Used
2. None
3. Unknown
4. Special

# Table 8. Manufacturer Identification Codes

Manufacturer is an improper word to use, since this set of enumerations may be used in variables that describe the OEM company (see Universal Command #15).

Any enumerations in the range from 250-255 are Reserved and must not be used by any Field Device.

## Company Identification Code

|  |  |  |
| --- | --- | --- |
| **Decimal**  1 | **Hex**  01 | **Company Name**  Acromag |
| 2 | 02 | Allen Bradley |
| 3 | 03 | Ametek |
| 4 | 04 | Analog Devices |
| 5 | 05 | Elsag Bailey |
| 6 | 06 | Beckman |
| 7 | 07 | Bell Microsensor |
| 8 | 08 | Bourns |
| 9 | 09 | Bristol Babcock |
| 10 | 0A | Brooks Instrument |
| 11 | 0B | Chessell |
| 12 | 0C | Combustion Engineering |
| 13 | 0D | Daniel Industries |
| 14 | 0E | Delta |
| 15 | 0F | Dieterich Standard |
| 16 | 10 | Dohrmann |
| 17 | 11 | Endress & Hauser |
| 18 | 12 | Elsag Bailey |
| 19 | 13 | Fisher Controls |
| 20 | 14 | Foxboro |
| 21 | 15 | Fuji |
| 22 | 16 | ABB Automation |
| 23 | 17 | Honeywell |
| 24 | 18 | ITT Barton |
| 25 | 19 | Kay Ray/Sensall |
| 26 | 1A | ABB Automation |
| 27 | 1B | Leeds & Northrup |
| 28 | 1C | Leslie |
| 29 | 1D | M-System Co. |
| 30 | 1E | Measurex |
| 31 | 1F | Micro Motion |
| 32 | 20 | Moore Industries |
| 33 | 21 | Moore Products |
| 34 | 22 | Ohkura Electric |
| 35 | 23 | Paine |
| 36 | 24 | Rochester Instrument Systems |
| 37 | 25 | Ronan |
| 38 | 26 | Rosemount |

**Company Identification Code**

|  |  |  |
| --- | --- | --- |
| **Decimal**  39 | **Hex**  27 | **Company Name**  Peek Measurement |
| 40 | 28 | Schlumberger |
| 41 | 29 | Sensall |
| 42 | 2A | Siemens |
| 43 | 2B | Weed |
| 44 | 2C | Toshiba |
| 45 | 2D | Transmation |
| 46 | 2E | Rosemount Analytic |
| 47 | 2F | Metso Automation |
| 48 | 30 | Flowserve |
| 49 | 31 | Varec |
| 50 | 32 | Viatran |
| 51 | 33 | Delta/Weed |
| 52 | 34 | Westinghouse |
| 53 | 35 | Xomox |
| 54 | 36 | Yamatake |
| 55 | 37 | Yokogawa |
| 56 | 38 | Nuovo Pignone |
| 57 | 39 | Promac |
| 58 | 3A | Exac Corporation |
| 59 | 3B | Meggitt Mobrey |
| 60 | 3C | Arcom Control System |
| 61 | 3D | Princo |
| 62 | 3E | Smar |
| 63 | 3F | Foxboro Eckardt |
| 64 | 40 | Measurement Technology |
| 65 | 41 | Applied System Technologies |
| 66 | 42 | Samson |
| 67 | 43 | Sparling Instruments |
| 68 | 44 | Fireye |
| 69 | 45 | Krohne |
| 70 | 46 | Betz |
| 71 | 47 | Druck |
| 72 | 48 | SOR |
| 73 | 49 | Elcon Instruments |
| 74 | 4A | EMCO |
| 75 | 4B | Termiflex Corporation |
| 76 | 4C | VAF Instruments |
| 77 | 4D | Westlock Controls |
| 78 | 4E | Drexelbrook |
| 79 | 4F | Saab Tank Control |
| 80 | 50 | K-TEK |
| 81 | 51 | Flowdata |
| 82 | 52 | Draeger |
| 83 | 53 | Raytek |
| 84 | 54 | Siemens Milltronics PI |

**Company Identification Code**

|  |  |  |
| --- | --- | --- |
| **Decimal** | **Hex** | **Company Name** |
| 85 | 55 | BTG |
| 86 | 56 | Magnetrol |
| 87 | 58 | Metso Automation |
| 88 | 59 | Milltronics |
| 89 | 59 | HELIOS |
| 90 | 5A | Anderson Instrument Company |
| 91 | 5B | INOR |
| 92 | 5C | ROBERTSHAW |
| 93 | 5D | PEPPERL+FUCHS |
| 94 | 5E | ACCUTECH |
| 95 | 5F | Flow Measurement |
| 96 | 60 | KAMSTRUP |
| 97 | 61 | Knick |
| 98 | 62 | VEGA |
| 99 | 63 | MTS Systems Corp. |
| 100 | 64 | Oval |
| 101 | 65 | Masoneilan-Dresser |
| 102 | 66 | BESTA |
| 103 | 67 | Ohmart |
| 104 | 68 | Harold Beck and Sons |
| 105 | 69 | rittmeyer instrumentation |
| 106 | 6A | Rossel Messtechnik |
| 107 | 6B | WIKA |
| 108 | 6C | Bopp & Reuther Heinrichs |
| 109 | 6D | PR Electronics |
| 110 | 6E | Jordan Controls |
| 111 | 6F | Valcom s.r.l. |
| 112 | 70 | US ELECTRIC MOTORS |
| 113 | 71 | Apparatebau Hundsbach |
| 114 | 72 | Dynisco |
| 115 | 73 | Spriano |
| 116 | 74 | Direct Measurement |
| 117 | 75 | Klay Instruments |
| 118 | 76 | Action Instruments |
| 119 | 77 | MMG Automatiky DTR |
| 120 | 78 | Buerkert Fluid Control Systems |
| 121 | 79 | AALIANT Process Mgt |
| 122 | 7A | PONDUS INSTRUMENTS |
| 123 | 7B | ZAP S.A. Ostrow Wielkopolski |
| 124 | 7C | GLI |
| 125 | 7D | Fisher-Rosemount Performance Technologies |
| 126 | 7E | Paper Machine Components |
| 127 | 7F | LABOM |
| 128 | 80 | Danfoss |
| 129 | 81 | Turbo |

**Company Identification Code**

|  |  |  |
| --- | --- | --- |
| **Decimal** | **Hex** | **Company Name** |
| 130 | 82 | TOKYO KEISO |
| 131 | 83 | SMC |
| 132 | 84 | Status Instruments |
| 133 | 85 | Huakong |
| 134 | 86 | Duon System |
| 135 | 87 | Vortek Instruments, LLC |
| 136 | 88 | AG Crosby |
| 137 | 89 | Action Instruments |
| 138 | 8A | Keystone Controls |
| 139 | 8B | Thermo Electric Co. |
| 140 | 8C | ISE-Magtech |
| 141 | 8D | Rueger |
| 142 | 8E | Mettler Toledo |
| 143 | 8F | Det-Tronics |
| 144 | 90 | TN Technologies |
| 145 | 91 | DeZURIK |
| 146 | 92 | Phase Dynamics |
| 147 | 93 | WELLTECH SHANGHAI |
| 148 | 94 | ENRAF |
| 149 | 95 | 4tech ASA |
| 150 | 96 | Brandt Instruments |
| 151 | 97 | Nivelco |
| 152 | 98 | Camille Bauer |
| 153 | 99 | Metran |
| 154 | 9A | Milton Roy Co. |
| 155 | 9B | PMV |
| 156 | 9C | Turck |
| 157 | 9D | Panametrics |
| 158 | 9E | Stahl |
| 159 | 9F | Analytical Technology Inc. |
| 160 | A0 | Fieldbus International |
| 161 | A1 | BERTHOLD |
| 162 | A2 | InterCorr |
| 163 | A3 | China BRICONTE Co Ltd |
| 164 | A4 | Electron Machine |
| 165 | A5 | Sierra Instruments |
| 166 | A6 | Fluid Components Intl |

**Company Identification Code**

**Decimal Hex Company Name**

|  |  |  |
| --- | --- | --- |
| 250 | FA | not\_used |
| 251 | FB | none |
| 252 | FC | unknown |
| 253 | FD | special |

# Table 9. Burst Mode Control Codes

## Burst Mode

**Control Code Definition**

1. Off
2. On
3. Not Used
4. None
5. Unknown
6. Special

# Table 10. Physical Signaling Codes

Enumeration 7 is Reserved , potentially for an expansion indication. Any enumerations in the range from 8-255 are not allowed.

## Physical Signal

**Code Definition**

1. Bell 202 Current
2. Bell 202 Voltage

2 RS-485

3 RS-232

6 Special

# Table 11. Flag Assignments

Bit# 0x07 is Reserved , potentially for an expansion indication. Any bit not covered is Undefined .

## Flag Assignment

**Code Definition**

0x01 Multi-Sensor Field Device

0x02 EEPROM Control

0x04 Protocol Bridge Device

0x08-0x20 Reserved

0x40 C8PSK Capable Field Device

0x80 C8PSK In Multi-Drop Only

# Table 12. Transfer Service Function Codes

See Block Data Transfer Specification (HCF\_SPEC-190)

# Table 13. Transfer Service Identifier Codes

See Block Data Transfer Specification (HCF\_SPEC-190)

# Table 14. Operating Mode Codes

## Operating

**Mode Code Description**

*This Table is Reserved*

# Table 15. Analog Output Numbers Codes

|  |  |  |
| --- | --- | --- |
| **Code** | **Analog** | **Output Number Description** |
| 0 | Analog | Channel 0 |
| 1 | Analog | Channel 1 |
| 2 | Analog | Channel 2 |
| 3 | Analog | Channel 3 |
| 4 | Analog | Channel 4 |

* 1. **Table 16. Loop Current Mode Codes**

These codes apply to the loop current signaling state of the device.

## Code Loop Current Mode Description

1. Disabled
2. Enabled
3. Not Used
4. None
5. Unknown
6. Special

# Table 17. Extended Device Status Codes

Any bit not covered is Undefined .

## Code Description

0x01 **Maintenance Required.** This bit is set to indicate that, while the device has not malfunctioned, the Field Device requires maintenance.

0x02 **Device Variable Alert.** This bit is set if any Device Variable is in an Alarm or Warning State. The host should identify the Device Variable(s) causeing this to be set using the Device Variable Status indicators.

# Table 18. Lock Device Codes

These codes indicate whether the device has been placed in locked position to prevent any changes from being made manually or from another master.

## Code Lock Device Description

* 1. Unlocked
  2. Lock — Temporary (i.e., Device Reset or Power Loss releases the Lock)
  3. Lock — Permanent (i.e., Device Reset or Power Loss does not affect the Lock)

1. Not Used
2. None
3. Unknown
4. Special

# Table 19. Write Device Variable Codes

These codes indicate whether the Device Variable s engineering value is forced to a fixed value or is in normal operation.

## Code Write Device Variable Command Description

1. Normal
2. Fixed Value
3. Not Used
4. None
5. Unknown
6. Special

# Table 20. Device Variable Family Codes

These codes indicate which family the Device Variable belongs to. If the Device Variable does not support Device Family Commands, then 250, "Not Used" must be returned.

|  |  |  |  |
| --- | --- | --- | --- |
| **Code** | **Device Variable Family** | **Code** | **Device Variable Family** |
| 0-3 | Reserved. MUST NOT BE USED |  |  |
| 4 | Temperature |  |  |
| 5 | Pressure |  |  |
| 6 | Valve / Actuator |  |  |
| 7 | Simple PID Control |  |  |
| 132 - | Reserved. MUST NOT BE USED |  |  |

249

1. Not Used
2. None
3. Unknown
4. Special

# Table 21. Device Variable Classification Codes

These codes indicate the function performed by the Device Variable. This allows Masters and Host Applications to identify the type of process connection supported by the Device Variable and the Unit Code Expansion table to be used.

|  |  |  |  |
| --- | --- | --- | --- |
| **Code** | **Device Variable Classification** | **Code** | **Device Variable Classification** |
| 0 | Device Variable Not Classified | 89 | Volume Per Mass |
| 1-63 | Reserved | 90 | Concentration |
| 64 | Temperature | 91 | Valve Actuator |
| 65 | Pressure |  |  |
| 66 | Volumetric Flow |  |  |
| 67 | Velocity |  |  |
| 68 | Volume |  |  |
| 69 | Length |  |  |
| 70 | Time | 250 | Not Used |
| 71 | Mass | 251 | None |
| 72 | Mass Flow | 252 | Unknown |
| 73 | Mass Per Volume | 253 | Special |
| 74 | Viscosity |  |  |
| 75 | Angular Velocity |  |  |
| 76 | Area |  |  |
| 77 | Energy (Work) |  |  |
| 78 | Force |  |  |
| 79 | Power |  |  |
| 80 | Frequency |  |  |
| 81 | Analytical |  |  |
| 82 | Capacitance |  |  |
| 83 | Emf |  |  |
| 84 | Current |  |  |
| 85 | Resistance |  |  |
| 86 | Angle |  |  |
| 87 | Conductance |  |  |
| 88 | Volume Per Volume |  |  |

# Table 22. Trim Point Codes

These codes indicate which trim points are supported by the Field Device.

## Code Trim Point Supported

1. Reserved
2. Lower Trim Point Supported
3. Upper Trim Point Supported
4. Lower And Upper Trim Point Supported
5. Not Used
6. None
7. Unknown
8. Special

# Table 23. Capture Mode Codes

These codes indicate whether to capture data using the configuration sent in Command 113 Catch Device Variable

## Code Capture Mode

1. Disabled
2. Enabled - Catch data from specified Field Device
3. Enabled - Catch data from BACK message
4. Not Used
5. None
6. Unknown
7. Special

# Table 24. Physical Layer Type Codes

These codes indicate the kind of Physical Layer sending the message.

## Code Physical Layer Type

* 1. Asynchronous (e.g., FSK, RS-485)
  2. Synchronous (e.g., PSK)

3 Reserved

# Table 25. Lock Device Status

These codes indicate whether the device is locked (see Command 71 Lock Device).

## Code Physical Layer Type

0x01 Device Locked

0x02 Lock is Permanent

0x04 Locked by Primary Master

# Table 26. Analog Channel Flags

These codes are used to clarify Analog Channel functions

## Code Flag Definition

0x01 This Analog Channel is a Field Device analog input channel. In other words, the Field Device has an ADC connected to this channel when this bit is set.

# ANNEX A. REVISION HISTORY

## A1. Modifications from Revision 12.0 to Revision 13.0

The last revision to the document titled: HART-Smart Communications Protocol, Common Tables , was HCF\_SPEC-183, Revision 12.0. For Revision 13.0, the document tables have been updated to reflect the following changes:

Changes to Table 1. Unique (Rosemount and subsidiaries) Device Type Codes Renamed — "Device Type Codes"

Added Device Type Code tables

Table 1.03 Ametek Device Type Codes

Table 1.10 Brooks Instrument Device Type Codes Table 1.14 Delta Device Type Codes

Table 1.17 Endress & Hauser Device Type Codes Table 1.18 Elsag Bailey Device Type Codes Table 1.20 Foxboro Device Type Codes

Table 1.21 Fuji Device Type Codes

Table 1.22 ABB Automation Device Type Codes Table 1.23 Honeywell Device Type Codes

Table 1.25 Kay Ray Sensall Device Type Codes Table 1.26 ABB Automation Device Type Codes Table 1.31 Micro Motion Device Type Codes Table 1.32 Moore Industries Device Type Codes Table 1.33 Moore Products Device Type Codes Table 1.38 Rosemount Device Type Codes

Table 1.39 Peek Measurement Device Type Codes Table 1.40 Schlumberger Device Type Codes Table 1.42 Siemens Device Type Codes

Table 1.44 Toshiba Device Type Codes

Table 1.46 Rosemount Analytical Device Type Codes Table 1.47 Metso Automation Device Type Codes Table 1.48 Flowserve Device Type Codes

Table 1.52 Viatran Device Type Codes Table 1.54 Yamatake Device Type Codes Table 1.55 Yokogawa Device Type Codes

Table 1.59 Meggitt Mobrey Device Type Codes Table 1.61 Princo Device Type Codes

Table 1.62 Smar Device Type Codes

Table 1.63 Foxboro Eckardt Device Type Codes Table 1.66 Samson Device Type Codes

Table 1.67 Sparling Instruments Device Type Codes Table 1.69 Krohne Device Type Codes

Table 1.77 Westlock Controls Device Type Codes

Table 1.78 Drexelbrook Device Type Codes

Table 1.79 Saab Tank Control Device Type Codes Table 1.80 K-TEK Device Type Codes

Table 1.82 Draeger Device Type Codes

Table 1.84 Siemens Milltronics PI Device Type Codes Table 1.86 Magnetrol Device Type Codes

Table 1.87 Metso Automation Device Type Codes Table 1.88 Milltronics Device Type Codes

Table 1.90 Anderson Instrument Company Device Type Codes Table 1.91 Inor Device Type Codes

Table 1.92 Robertshaw Device Type Codes Table 1.94 Accutech Device Type Codes Table 1.96 Kamstrup Device Type Codes Table 1.97 Knick Device Type Codes

Table 1.101 Masoneilan-Dresser Device Type Codes Table 1.102 Besta Device Type Codes

Table 1.103 Ohmart Device Type Codes

Table 1.104 Harold Beck and Sons Device Type Codes Table 1.107 Wika Device Type Codes

Table 1.108 Bopp & Reuther Heinrichs Device Type Codes Table 1.109 PR Electronics Device Type Codes

Table 1.113 Apparatebau Hundsbach Device Type Codes Table 1.114 Dynisco Device Type Codes

Table 1.116 Direct Measurement Device Type Codes

Table 1.120 Buerkert Fluid Control Systems Device Type Codes Table 1.124 GLI Device Type Codes

Table 1.126 Paper Machine Components Device Type Codes Table 1.127 Labom Device Type Codes

Table 1.129 Turbo Device Type Codes Table 1.131 SMC Device Type Codes

Table 1.132 Status Instruments Device Type Codes Table 1.133 Huakong Device Type Codes

Table 1.135 Vortek Instruments, LLC Device Type Codes Table 1.137 Action Instruments Device Type Codes Table 1.140 Magtech Device Type Codes

Table 1.141 Rueger Device Type Codes

Table 1.144 TN Technologies Device Type Codes Table 1.145 Dezurik Device Type Codes

Table 1.147 WELLTECH SHANGHAI Device Type Codes Table 1.154 Milton Roy Co. Device Type Codes

Table 1.155 PMV Device Type Codes Table 1.156 Turck Device Type Codes

Added Unit Code Expansion tables Table 2.1 Temperature Unit Codes

Table 2.2 Pressure Unit Codes

Table 2.3 Volumetric Flow Unit Codes Table 2.4 Velocity Unit Code

Table 2.5 Volume Unit Code Table 2.6 Length Unit Code Table 2.7 Time Unit Code Table 2.8 Mass Unit Code Table 2.9 Mass Flow Code

Table 2.10 Mass per Volume Unit Code Table 2.11 Viscosity Unit Code

Table 2.12 Angular Velocity Unit Code Table 2.13 Area Unit Code

Table 2.14 Energy (Work) Unit Code Table 2.15 Force Unit Code

Table 2.16 Power Unit Code Table 2.17 Frequency Unit Code Table 2.18 Analytical Unit Code Table 2.19 Capacitance Unit Code Table 2.20 EMF Unit Code

Table 2.21 Current Unit Code Table 2.22 Resistance Unit Code Table 2.23 Angle Unit Code

Table 2.24 Conductance Unit Code

Table 2.25 Volume per Volume Unit Code Table 2.26 Volume per Mass Unit Code Table 2.27 Concentration Unit Code

Added Enhanced Status tables

Table 16. Loop Current Mode Codes Table 17. Extended Device Status Codes Table 18. Lock Device Codes

Added Device Variable tables

Table 19. Write Device Variable Command Codes Table 20. Device Family Support Codes

Table 21. Device Variable Classification Codes

Changes to Table 1a. Rosemount Device Type Codes Table re-sequenced:

"1a " changed to "1.38" Enumeration(s) added:

47

Enumerations(s) modified: None

Changes to Table 1b. Rosemount Analytical Device Type Codes Table re-sequenced:

"1b" changed to "1.46" Enumeration(s) added:

None Enumerations(s) modified:

None

Changes to Table 1c. KayRay Device Type Codes Table re-sequenced:

"1c " changed to "1.25" Enumeration(s) added:

None Enumerations(s) modified:

None

Changes to Table 1d. Micro Motion Device Type Codes Table re-sequenced:

"1c " changed to "1.31" Enumeration(s) added:

Changes to Table 8. Manufacturer Identification Codes Enumeration(s) added:

141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154

Enumeration(s) modified

22 - changed to "ABB Automation" 26 - changed to "ABB Automation"

121- changed to "AALIANT Process Mgt"

APPENDIX A: Unique (Rosemount and Subsidiaries) Device Type Codes Deleted

APPENDIX B: Device Description language file Deleted

## A2. Modifications from Revision 11.0 to Revision 12.0

The last revision to the document titled: HART-Smart Communications Protocol, Common Tables , was HCF\_SPEC-183, Revision 11.0. For Revision 12.0, the document tables have been updated to reflect the following changes:

Changes to Table 8. Manufacturer Identification Codes Enumeration(s) added:

141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 160, 161, 162, 163

## A3. Modifications from Revision 10.0 to Revision 11.0

The last revision to the document titled: HART-Smart Communications Protocol, Common Tables , was HCF\_SPEC-183, Revision 10.0. For Revision 11.0, the document tables have been updated to reflect the following changes:

Changes to Table 1a. Rosemount Device Type Codes.

Enumeration(s) added:

40, 41, 42, 45

Changes to Table 2. Unit Codes.

Enumeration(s) added:

145, 146, 147, 148, 149, 154, 155, 161, 169

Enumerations(s) modified: None

Changes to Table 3. Transfer Function Codes.

Enumeration(s) added:

230

Enumerations(s) modified: None

Changes to Table 4. Material Codes.

Enumeration(s) added:

38

Enumerations(s) modified: None

Changes to Table 8. Manufacturer Identification Codes Enumeration(s) added:

114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131,

132, 133, 134, 135, 136, 137, 138, 139, 140

Enumeration(s) modified 43 - changed to "Weed"

48 - changed to "Flowserve" 51 - changed to "Delta/Weed"

59 — changed to "Meggitt Mobrey"

## A4. Modifications from Revision 9.0 to Revision 10.0

The last revision to the document titled: HART-Smart Communications Protocol, Common Tables , was HCF\_SPEC-183, Revision 9.0. For Revision 10.0, the document has been formatted for ease of use. In addition to formatting, the document tables have been updated to reflect the following changes:

Changes to Table 1a. Rosemount Device Type Codes.

Enumeration(s) added:

35, 36, 38, 39

Changes to Table 2. Unit Codes.

Enumeration(s) added:

144

Enumerations(s) modified: None

Changes to Table 8. Manufacturer Identification Codes Enumeration(s) added:

79, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113

Enumeration(s) modified

5, 18, 22 - changed to "Elsag Bailey"

63 - changed to "FOXBORO ECKARDT" 87 - changed to "Neles Controls"