

Practical use of ISO 15926

Session 3

The “modelling process” with example “ambient operating temperature”

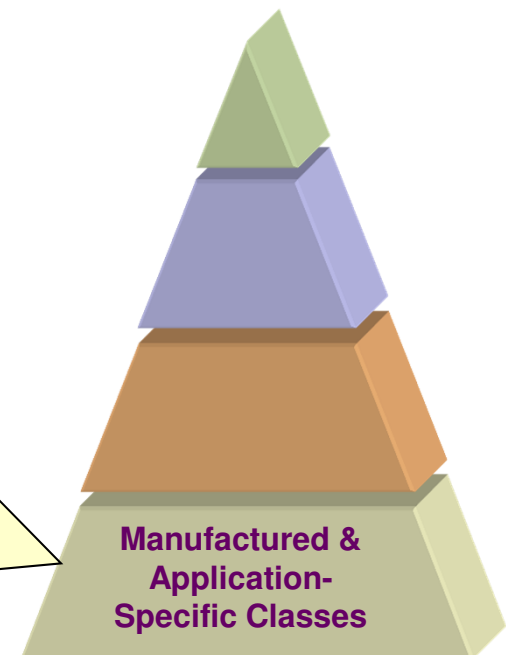
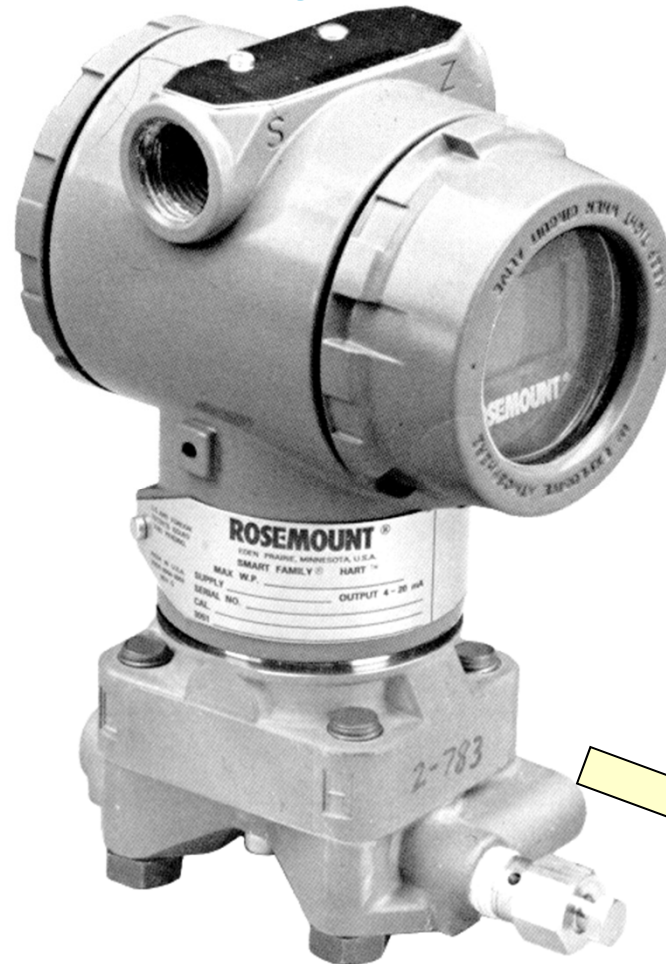
June 7, 2011

Magne Valen-Sendstad, DNV

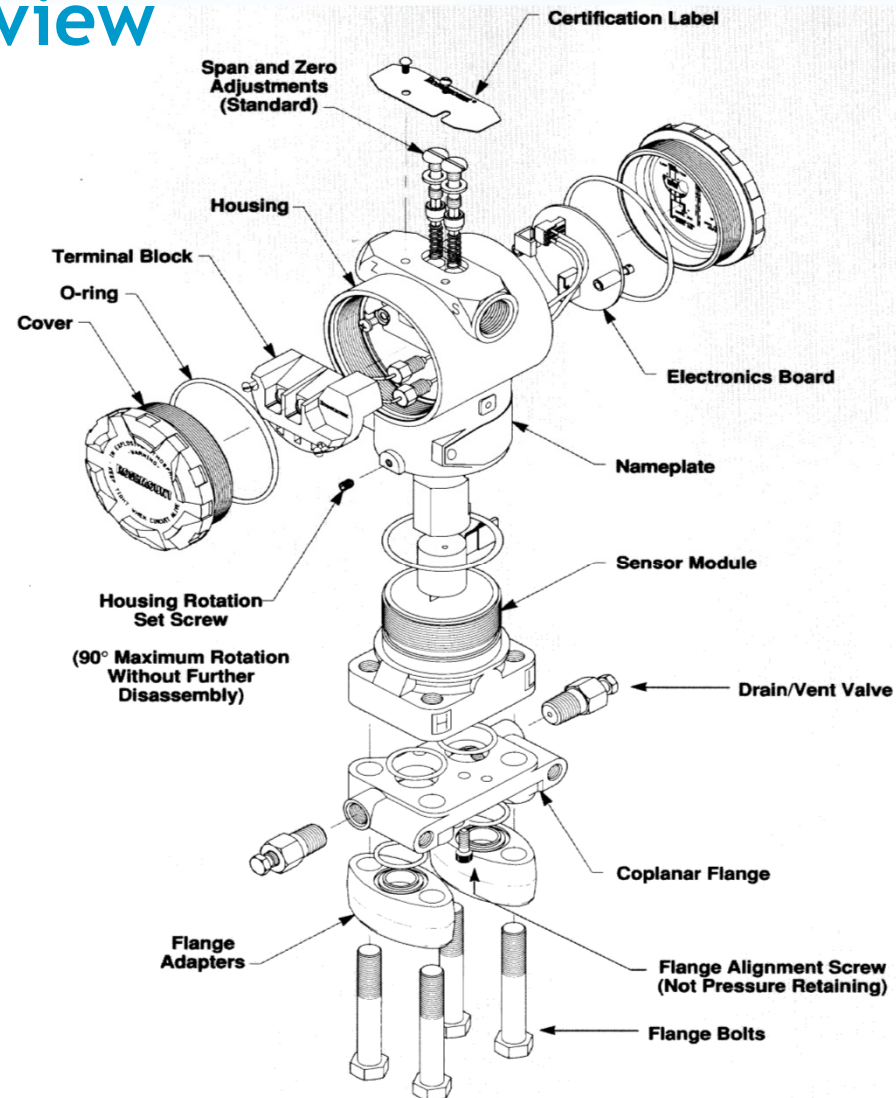
with

Johan W. Klüwer, DNV

In this session we will use a class of “Electric Pressure Transmitter” as basis for the examples
Rosemount 3051 Gauge Pressure Transmitter



Rosemount 3051 Gauge Pressure Transmitter, exploded view



Example of multiple representations of the same thing

NORSOK		INSTRUMENT DATASHEET P01					
		PRESSURE / DIFF. PRESSURE INSTRUMENT ELECTRIC					
Tag number :	Scale Range :	Service description :	Set/Alarm Point :				
P&ID :	Area :	Line/equipment no. :	P. O. Number :				
1 GENERAL		6 TRANSMITTER					
1.01 Type :	5.01 Indicator :	1.02 Manufacturer :	5.02 Output signal :				
1.03 Manufacturer model no. :	5.03 Communication :	1.04 Operating Temp. Limits :	5.04 Supply voltage :				
1.05 Mounting :	5.05 Consumption :	1.06 Weight :	5.06 Load limitation :				
1.07 Other :	5.07 Other :						
2 INSTRUMENT CHARACTERISTICS		6 SWITCH					
2.01 Calibrated input range :	6.01 Reset; automatic or manual :	2.02 Characteristic :	6.02 Deadband or differential :				
2.03 Accuracy :	6.03 Alarm at increase/decrease :	2.04 Repeatability :	6.04 Contact configuration :				
2.05 Lower / upper range limits :	6.05 Contact material :	2.06 Min / max span :	6.06 Contact rating :				
2.07 Zero adjustment :	6.07 Contact action on alarm :	2.08 Overpressure protect. to :	6.08 Other :				
2.09 Max static pressure :		2.10 Other :					
3 ELEMENT / SENSOR		7 CHEMICAL SEAL					
3.01 Type :	7.01 Type :	3.02 Material, element (sensor) :	7.02 Material, upper/lower part :				
3.03 Material, socket (inlet port) :	7.03 Material, bolts / nuts :	3.04 Material, sensor bolts/nuts :	7.04 Material, diaphragm :				
3.05 Process conn. size/type :	7.05 Fill fluid :	3.06 Sour service spec. :	7.06 Capillary length/diameter :				
3.07 Other :	7.07 Material, capillary/armour :		7.08 Process conn. size/type :				
	7.09 Other :						
4 HOUSING		8 ACCESSORIES					
4.01 Dimension :	8.01 Mounting bracket :	4.02 Material :	8.02 Material, mounting bracket :				
4.03 Cable connection :	8.03 Overpr. protection valve :	4.04 Cable entry :	8.04 Material, overpr. prot. valve :				
4.05 Enclosure protection :	8.05 Pulsation damper :	4.06 Ex. classification :	8.06 Material, pulsation damper :				
4.07 Protective coating :	8.07 Other :	4.08 Other :					
		9 NOTES					
Rev	Date	Issue/description	Prepared	Checked	Approved	Datasheet no.	Page

SHARECAT		Datasheet					
		Transmitter, Pressure, Electric					
Document Number :	28-1A-KOG-I54-27500-0012	Revision :	1				
Plant/Platform :	Test Installation 2	Process Datash. No. :	N/A				
Tag number :	PT 42-0304	System :	N/A				
SerialNo :	N/A	Range From :	0				
SetPoint Low :	10 barG	Range To :	110				
SetPoint High :	71 barG	Range Unit :	barG				
P & ID :	28-1A-KOG-C78-00275-0002	Area :	N/A				
Line/Equipment no. :	XX-42-0002	PO :	T12-M022-ME-01				
Service description :	SCALE INHIBITOR. PUMP OUTLET						
Unique no. :	TEK-00018117	1. Accepted 2. Accepted with comments incorporated 3. Not accepted, revise and resubmit 4. Issued for information 5. Interface information as clouded is accepted and frozen					
Manufacturer :	EMERSON PROCESS MANAGEMENT	Date:	1 2 3 4 5				
Type :	3051CG	Sign:					
Manuf. Partno. :	3051CG-5-A-2-2-A-1-K-B4-11-L4-M6-Q4						
Class :	Transmitter, Pressure, Electric						
Area		General					
Explosion protection :	EEEx ia	Description :	Gauge				
Gas-group :	IIC	Description :	Smart, hart protocol				
Temperature class :	T5	Supply :	10.5 - 55 VDC				
Approval authority :	BASEEFA	Mounting :	Coplanar flange bracket for pipe or panel				
Certificate :	BAS 97ATEX1089X						
IP-Class :	IP66	Material					
ATEX group :	II	Body material :	Stainless steel				
ATEX category :	1	Filling fluid :	Silicone oil				
ATEX explosive atmosphere :	G	Seal material :	Glass filled TFE				
Ambient temperature :	40 - 85 °C	Process connection material :	Stainless steel				
Dimensions and Weight		Non process cover material :	316				
Weight :	4.7 kg	Flange bolt material :	316 AUSTENITIC				
Function		Drain/vent material :	Stainless steel				
Range :	0 - 13800 kPa	Diaphragm material low pressure :	316L				
Span limit minimum, Pressure :	138 kPa	Diaphragm material high pressure :	316L				
Span limit maximum, Pressure :	13800 kPa	connection :					
Alternative Range :	0 - 138 bar	Bracket material :	Stainless steel				
Alternative span limit minimum, Pressure :	1.38 bar	Bracket bolt material :	Stainless steel				
Alternative span limit maximum, Pressure :	138 bar	Adapter bolt material :	316 AUSTENITIC				
Output signal :	4 - 20 mA	Process Connection					
Accuracy :	+/- 0.075 %	Connection design :	NPT				
Display type :	LCD	Size :	14"				
Static working pressure :	3626 psi	Thread pitch :	18 thr/in				
Comment		Supply Connection					
Accuracy for span greater than 10:1 of URL. Power consumption 18-36 mW. Load limitation: 587 Ohm. Static pressure value valid within transmitter temperature spec. Output: Digital signal based on hart protocol. Coplanar flange Intrinsic Safety and Dust approval. Calibration data sheet (5 points calibration at 0%, 25%, 50%, 75%, and 100% of range)		Supply connection design :	Metric threaded				
		Supply connection size :	20 mm				
		Thread pitch supply :	1.5 mm/thr				
1	09.11.2006 14.44	Generated by	SHARECAT P.M.				
Rev	Date	Issue/description	Prepared	Checked	Disc. Appr	Client Appr	Page 1 of 1

Intelligent Data Sheets Project

- developing neutral product models to support data exchange and integration using “Intelligent Data Sheets” and to
- use these to support new collaborative work processes within and between organizations.
- (companies in the supply chain can save substantially by having one interface to relate to)

NORSOK		INSTALLMENT DOCUMENTATION	
PRELIMINARY PRELIMINARY DOCUMENTATION			
1. GENERAL		4. TRANSMITTER	
2. INSTRUMENT CHARACTERISTICS		5. CERTIFICATION	
3. ELEMENT / SENSOR		6. CHEMICAL SEAL	
7. ACCESSORIES		8. MOUNTING	
9. NOTES			

SHARED		SHARED	
DOCUMENTATION			
1. GENERAL		4. TRANSMITTER	
2. INSTRUMENT CHARACTERISTICS		5. CERTIFICATION	
3. ELEMENT / SENSOR		6. CHEMICAL SEAL	
7. ACCESSORIES		8. MOUNTING	
9. NOTES			



Many different, view dependant descriptions

- business
- company
- phase (lifecycle)
- application (DS/2D/3D)
- etc



One neutral, extendable description, supporting multiple views across phases and applications

Area in focus for this tutorial

NORSOK		INSTRUMENT DATASHEET P01				
		PRESSURE / DIFF. PRESSURE INSTRUMENT ELECTRIC				
Tag number :	Scale Range :	Service description :	Set/Alarm Point :			
P&ID :	Area :	Line/equipment no. :	P. O. Number :			
1 GENERAL		6 TRANSMITTER				
1.01 Type :	5.01 Indicator :	1.02 Manufacturer :	5.02 Output signal :			
1.03 Manufacturer model no. :	5.03 Communication :	1.04 Operating Temp. Limits :	5.04 Supply voltage :			
1.05 Mounting :	5.05 Consumption :	1.06 Weight :	5.06 Load limitation :			
1.07 Other :	5.07 Other :	6 SWITCH				
2 INSTRUMENT CHARACTERISTICS		2.01 Calibrated input range :	6.01 Reset; automatic or manual :			
2.02 Characteristic :	6.02 Deadband or differential :	2.03 Accuracy :	6.03 Alarm at increase/decrease :			
2.04 Repeatability :	6.04 Contact configuration :	2.05 Lower / upper range limits :	6.05 Contact material :			
2.06 Min / max span :	6.06 Contact rating :	2.07 Zero adjustment :	6.07 Contact action on alarm :			
2.08 Overpressure protect. to :	6.08 Other :	2.09 Max static pressure :	7 CHEMICAL SEAL			
2.10 Other :	7.01 Type :	3 ELEMENT / SENSOR		7.02 Material, upper/lower part :		
3.01 Type :	7.03 Material, bolts / nuts :	3.02 Material, element (sensor) :	7.04 Material, diaphragm :	7.05 Fill fluid :		
3.03 Material, socket (inlet port) :	7.06 Capillary length/diameter :	3.04 Material, sensor bolts/nuts :	7.07 Material, capillary/armour :	7.08 Process conn. size/type :		
3.05 Process conn. size/type :	7.09 Other :	3.06 Sour service spec. :	8 ACCESSORIES			
3.07 Other :	8.01 Mounting bracket :	4 HOUSING		8.02 Material, mounting bracket :		
4.01 Dimension :	8.03 Overpr. protection valve :	4.02 Material :	8.04 Material, overpr. prot. valve :	8.05 Pulsation damper :		
4.03 Cable connection :	8.06 Material, pulsation damper :	4.04 Cable entry :	8.07 Other :	9 NOTES		
4.05 Enclosure protection :						
4.06 Ex. classification :						
4.07 Protective coating :						
4.08 Other :						

SHARECAT		Datasheet	
		Transmitter, Pressure, Electric	
Document Number :	28-1A-KOG-I54-27500-0012	Revision :	1
Plant/Platform :	Test Installation 2	Process Datash. No. :	N/A
Tag number :	PT 42-0304	System :	N/A
SerialNo :	N/A	Range From :	0
SetPoint Low :	10 barG	Range To :	110
SetPoint High :	71 barG	Range Unit :	barG
P & ID :	28-1A-KOG-C78-00275-0002	Area :	N/A
Line/Equipment no. :	XX-42-0002	PO :	T12-M022-ME-01
Service description :	SCALE INHIBITOR. PUMP OUTLET		
Unique no. :	TEK-00018117	1. Accepted	
Manufacturer :	EMERSON PROCESS MANAGEMENT	2. Accepted with comments incorporated	
Type :	3051CG	3. Not accepted, revise and resubmit	
Manuf. Partno. :	3051CG-5-A-2-2-A-1-K-B4-11-L4-M6-Q4	4. Issued for information	
Class :	Transmitter, Pressure, Electric	5. Interface information as clouded is accepted and frozen	
		Date:	1 2 3 4 5
		Sign:	
Area		General	
Explosion protection :	EEx ia	Description :	Gauge
Gas-group :	IIC	Description :	Smart, hart protocol
Temperature class :	T5	Supply :	10.5 - 55 VDC
Approval authority :	BASEEFA	Mounting :	Coplanar flange bracket for pipe or panel
Certificate :	BAS 97ATEX1089X	Material	
IP-Class :	IP66	Body material :	Stainless steel
ATEX group :	II	Filling fluid :	Silicone oil
ATEX category :	1	Seal material :	Glass filled TFE
ATEX explosive atmosphere :	G	Process connection material :	Stainless steel
Ambient temperature :	-40 - 85 °C	Non process cover material :	316
Dimensions and Weight		Flange bolt material :	316 AUSTENITIC
Weight :	4.7 kg	Drain/vent material :	Stainless steel
Function		Diaphragm material low pressure :	316L
Range :	0 - 13800 kPa	connection	
Span limit minimum, Pressure :	138 kPa	Diaphragm material high pressure :	316L
Span limit maximum, Pressure :	13800 kPa	connection	
Alternative Range :	0 - 138 bar	Bracket material :	Stainless steel
Alternative span limit minimum, Pressure :	1.38 bar	Bracket bolt material :	Stainless steel
Alternative span limit maximum, Pressure :	138 bar	Adapter bolt material :	316 AUSTENITIC
Pressure :		Process Connection	
Output signal :	4 - 20 mA	Connection design :	NPT
Accuracy :	+/- 0.075 %	Size :	14"
Display type :	LCD	Thread pitch :	18 thr/in
Static working pressure :	3626 psi	Supply Connection	
		Supply connection design :	Metric threaded
		Supply connection size :	20 mm
		Thread pitch supply :	1.5 mm/thr
Comment			
Accuracy for span greater than 10:1 of URL. Power consumption 18-36 mW. Load limitation: 587 Ohm. Static pressure value valid within transmitter temperature spec. Output: Digital signal based on hart protocol. Coplanar flange Intrinsic Safety and Dust approval. Calibration data sheet (5 points calibration at 0%, 25%, 50%, 75%, and 100% of range)			
1	09.11.2006 14.44	Generated by SHARECAT P.M.	
Rev	Date	Issue/Description	Page 1 of 1

Uniqueness of Alphanumeric “Attributes”

Area

Explosion protection	: EEx ia
Gas-group	: IIC
Temperature class	: T5
Approval authority	: BASEEFA
Certificate	: BAS 97ATEX1089X
IP-Class	: IP66
ATEX group	: II
ATEX category	: 1
ATEX explosive atmosphere	: G
Ambient temperature	: -40 - 85 °C

The remainder of this tutorial will focus on how to map such, and similar “attributes”, to ISO15926, and to demonstrate exchange using iRING tools

T5: **Telecinco,**
 London Heathrow Terminal 5
 Volvo T5 (car or engine?)

T5 here: **T5 APPARATUS IEC 60079-0 (Class of products) (not mentioned by Wikipedia)**

IIC: **International Institute for Conservation of Historic and Artistic Works**

IIC here: **GROUP IIC APPARATUS IEC 60079-0 (Class of products)**

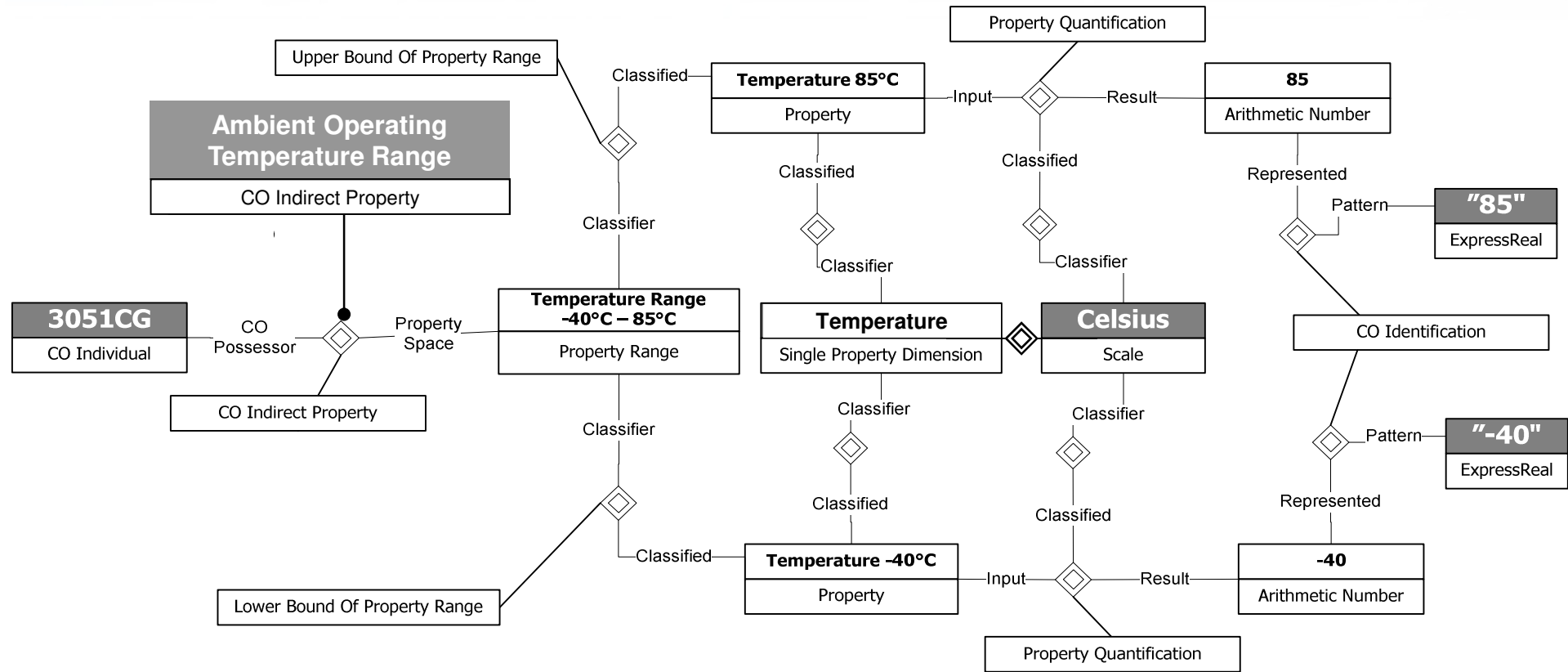
IP66: **IP66 APPARATUS IEC 60529 (Class of products)**

EEx ia: **EX IA APPARATUS IEC 60079-11 (Class of products)**

A range on the data sheet

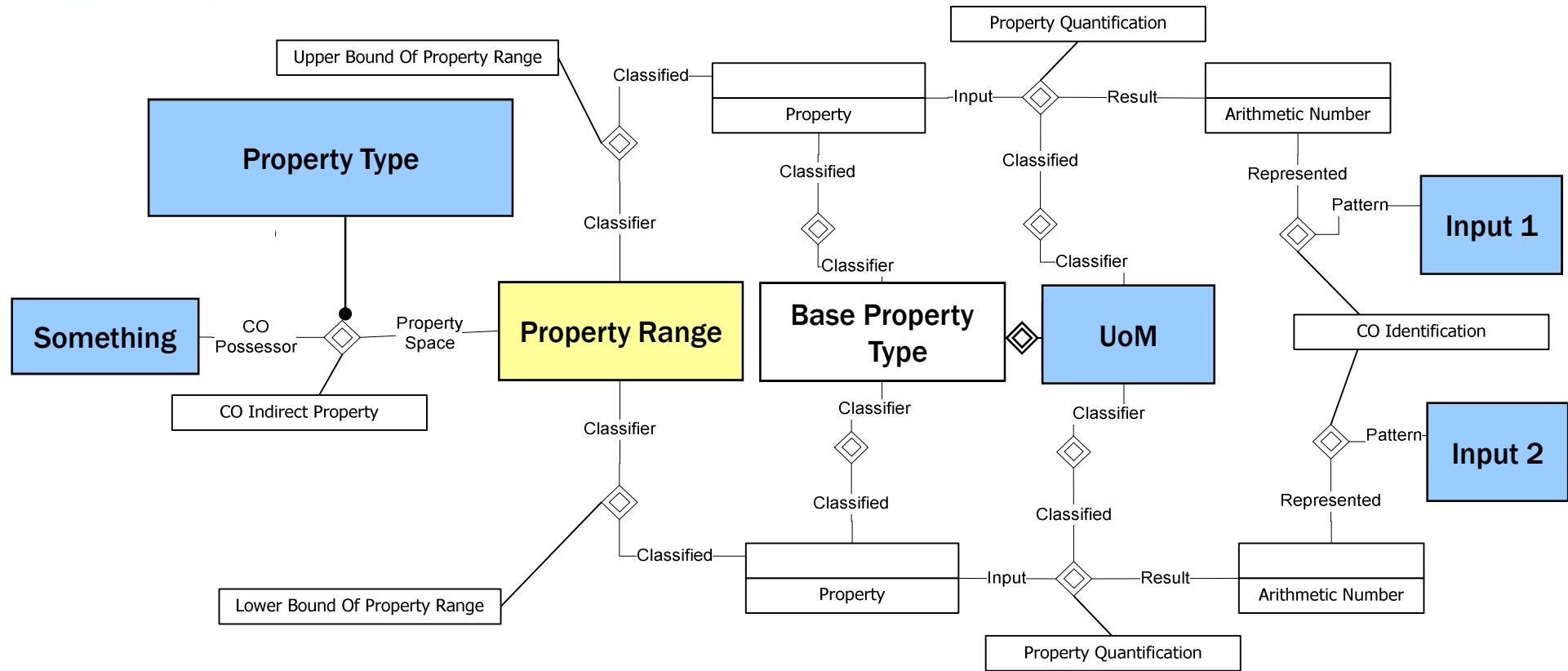
SHARECAT <small>ANY PART. ANY PROJECT. ANYWHERE.</small>		Datasheet Transmitter, Pressure, Electric	
Document Number	: 28-1A-KOG-154-27500-0012	Revision	: 1
Plant/Platform	: Test Installation 2	Process Datas. No.	: N/A
Tag number	: PT -42-0304	System	: N/A
SerialNo	: N/A	Range From	: 0
SetPoint Low	: 10 barG	Range To	: 110
SetPoint High	: 71 barG	Range Unit	: barG
P & ID	: 28-1A-KOG-C78-00275-0002	Area	: N/A
Line/Equipment no.	: XX-42-0002	PO:	: T12-M022-ME-01
Service description	: SCALE INHIBITOR. PUMP OUTLET		
Unique no.	TEK-00018117	1. Accepted 2. Accepted with comments incorporated 3. Not accepted, revise and resubmit 4. Issued for information 5. Interface information as clouded is accepted and frozen	
Manufacturer	EMERSON PROCESS MANAGEMENT		
Type	3051CG		
Manuf. Partno.	3051CG-5-A-2-2-A-1-K-B4-I1-		
Class	Transmitter, Pressure, Electric		
Area		ATEX group	: II
Explosion protection	: EEx ia	ATEX category	: 1
Gas-group	: IIC	ATEX explosive atmosphere	: G
Temperature class	: T5	Ambient temperature	: -40 - 85 °C
Approval authority	: BASEEFA		
Certificate	: BAS 97ATEX1089X		
IP-Class	: IP66		
ATEX group	: II		
ATEX category	: 1		
ATEX explosive atmosphere	: G		
Ambient temperature	: -40 - 85 °C		
Dimensions and Weight		Filling fluid	: Silicone oil
Weight	: 4.7 kg	Seal material	: Glass filled TFE
		Process connection material	: Stainless steel
		Non process cover material	: 316
		Flange bolt material	: 316 AUSTENITIC
		Drain/Vent material	: Stainless steel

Representation of “attribute”: Ambient Temperature




3051CG has a "rated ambient operating temperature": -40 C – 85 C

ISO 15926 Generic Property Range Template



'Something' has 'Property Type' with 'Property Range' of 'Base Property Type' defined by 'Input 1' and 'Input 2' with 'UoM'

"Semantic" Mapping User Interface


 Select RDL
 Class or
 Project Data


 Select from
 standard/
 customised list
 of RDL Instance


 Select from
 standard/
 customised list
 of RDL Instance

Temp. Inst. #	Something	Property Type	UoM	Input 1	Input 2
#nnn	3051CG	Ambient Operating Temperature Range	C	-40	85

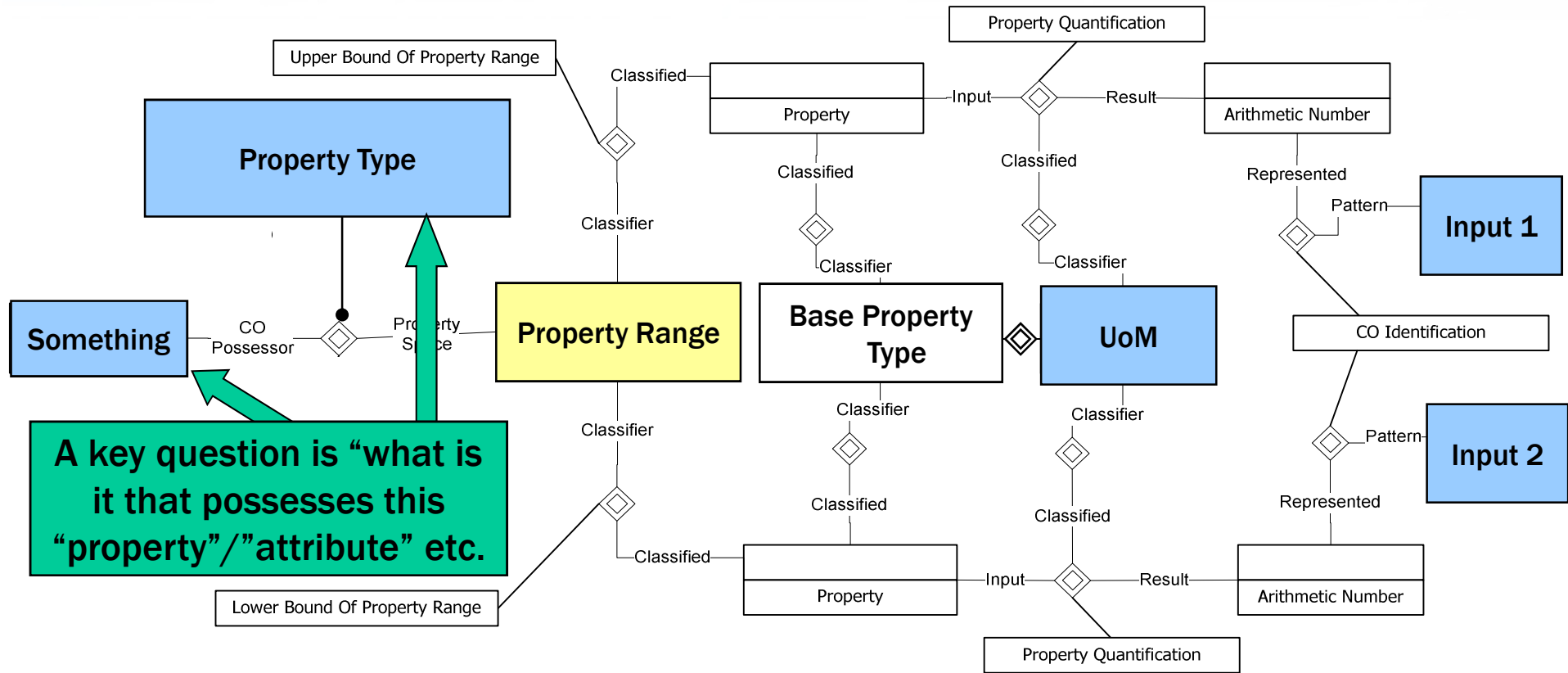
Property Range

Base Property Type

Implicit entities that only appear in the "full" model

Approach is applicable to any external data representation.

ISO 15926 Generic Property Range Template



Unrelated data related to the same thing

NORSOK		INSTRUMENT DATASHEET P01		
		PRESSURE / DIFF. PRESSURE INSTRUMENT ELECTRIC		
Tag number :	Scale Range :	Service description :	Set/Alarm Point :	
P&ID :	Area :	Line/equipment no. :	P. O. Number :	
1 GENERAL		5 TRANSMITTER		
1.01 Type :	5.01 Indicator :	1.02 Manufacturer :	5.02 Output signal :	
1.03 Manufacturer model no. :	5.03 Communication :	1.04 Operating Temp. Limits :	5.04 Supply voltage :	
1.05 Mounting :	5.05 Consumption :	1.06 Weight :	5.06 Load limitation :	
1.07 Other :	5.07 Other :			
2 INSTRUMENT CHARACTERISTICS		6 SWITCH		
2.01 Calibrated input range :	6.01 Reset; automatic or manual :	2.02 Characteristic :	6.02 Deadband or differential :	
2.03 Accuracy :	6.03 Alarm at increase/decrease :	2.04 Repeatability :	6.04 Contact configuration :	
2.05 Lower / upper range limits :	6.05 Contact material :	2.06 Min / max span :	6.06 Contact rating :	
2.07 Zero adjustment :	6.07 Contact action on alarm :	2.08 Overpressure protect. to :	6.08 Other :	
2.09 Max static pressure :				
2.10 Other :				
3 ELEMENT / SENSOR		7 CHEMICAL SEAL		
3.01 Type :	7.01 Type :	3.02 Material, element (sensor) :	7.02 Material, upper/lower part :	
3.03 Material, socket (inlet port) :	7.03 Material, bolts / nuts :	3.04 Material, sensor bolts/nuts :	7.04 Material, diaphragm :	
3.05 Process conn. size/type :	7.05 Fill fluid :	3.06 Sour service spec. :	7.06 Capillary length/diameter :	
3.07 Other :	7.07 Material, capillary/armour :			
4 HOUSING		8 ACCESSORIES		
4.01 Dimension :	8.01 Mounting bracket :	4.02 Material :	8.02 Material, mounting bracket :	
4.03 Cable connection :	8.03 Overpr. protection valve :	4.04 Cable entry :	8.04 Material, overpr. prot. valve :	
4.05 Enclosure protection :	8.05 Pulsation damper :	4.06 Ex. classification :	8.06 Material, pulsation damper :	
4.07 Protective coating :	8.07 Other :	4.08 Other :		
		9 NOTES		

SHARECAT		Datasheet	
		Transmitter, Pressure, Electric	
Document Number :	28-1A-KOG-I54-27500-0012	Revision :	1
Plant/Platform :	Test Installation 2	Process Datasheet No. :	N/A
Tag number :	PT -42-0304	System :	N/A
SerialNo :	N/A	Range From :	0
SetPoint Low :	10 barG	Range To :	110
SetPoint High :	71 barG	Range Unit :	barG
P & ID :	28-1A-KOG-C78-00275-0002	Area :	N/A
Line/Equipment no. :	XX-42-0002	PO:	T12-M022-ME-01
Service description :	SCALE INHIBITOR. PUMP OUTLET		
Unique no. :	TEK-00018117	<small>1. Accepted</small> <small>2. Accepted with comments incorporated</small> <small>3. Not accepted, revise and resubmit</small> <small>4. Issued for information</small> <small>5. Interface information as clouded is accepted and frozen</small>	
Manufacturer :	EMERSON PROCESS MANAGEMENT	Date:	1 2 3 4 5
Type :	3051CG	Sign:	
Manuf. Partno. :	3051CG-5-A-2-A-1-K-B4-I1-L4-M6-Q4		
Class :	Transmitter, Pressure, Electric		
Area		General	
Explosion protection :	EEx ia	Description :	Gauge
Gas-group :	IIC	Description :	Smart, hart protocol
Temperature class :	T5	Supply :	10.5 - 55 V DC
Approval authority :	BAS EEF A	Mounting :	Coplanar flange bracket for pipe or panel
Certificate :	BAS 97ATEX1089X	Material	
IP-Class :	IP66	Body material :	Stainless steel
ATEX group :	II	Filling fluid :	Silicone oil
ATEX category :	1	Seal material :	Glass filled TFE
ATEX explosive atmosphere :	G	Process connection material :	Stainless steel
Ambient temperature :	-40 - 85 °C	Non process cover material :	316
Dimensions and Weight		Flange bolt material :	316 AUSTENITIC
Weight :	4.7 kg	Drain/vent material :	Stainless steel
Function		Diaphragm material low pressure : connection :	316L
Range :	0 - 13800 kPa	Diaphragm material high pressure :	316L
Span limit minimum, Pressure :	138 kPa	Bracket material :	Stainless steel
Span limit maximum, Pressure :	13800 kPa	Bracket bolt material :	Stainless steel
Alternative Range :	0 - 138 bar	Adapter bolt material :	316 AUSTENITIC
Alternative span limit minimum, Pressure :	1.38 bar	Process Connection	
Alternative span limit maximum, Pressure :	138 bar	Connection design :	NPT
Output signal :	4 - 20 mA	Size :	1/4"
Accuracy :	±0.075 %	Thread pitch :	18 thr/in
Display type :	LCD	Supply Connection	
Static working pressure :	3626 psi	Supply connection design :	Metric threaded
		Supply connection size :	20 mm
		Thread pitch supply :	1.5 mm/thr
Comment	Accuracy for span greater than 10:1 of URL. Power consumption 18-36 mW. Load limitation: 587 Ohm. Static pressure value valid within transmitter temperature spec. Output: Digital signal based on hart protocol. Coplanar flange Intrinsic Safety and Dust approval. Calibration data sheet (5 points calibration at 0%, 25%, 50%, 75%, and 100% of range)		
1	09.11.2006 14:44	Generated by SHARECAT P.M.	
Rev.	Date	Issue/description	Page 1 of 1

Inconsistent Representations

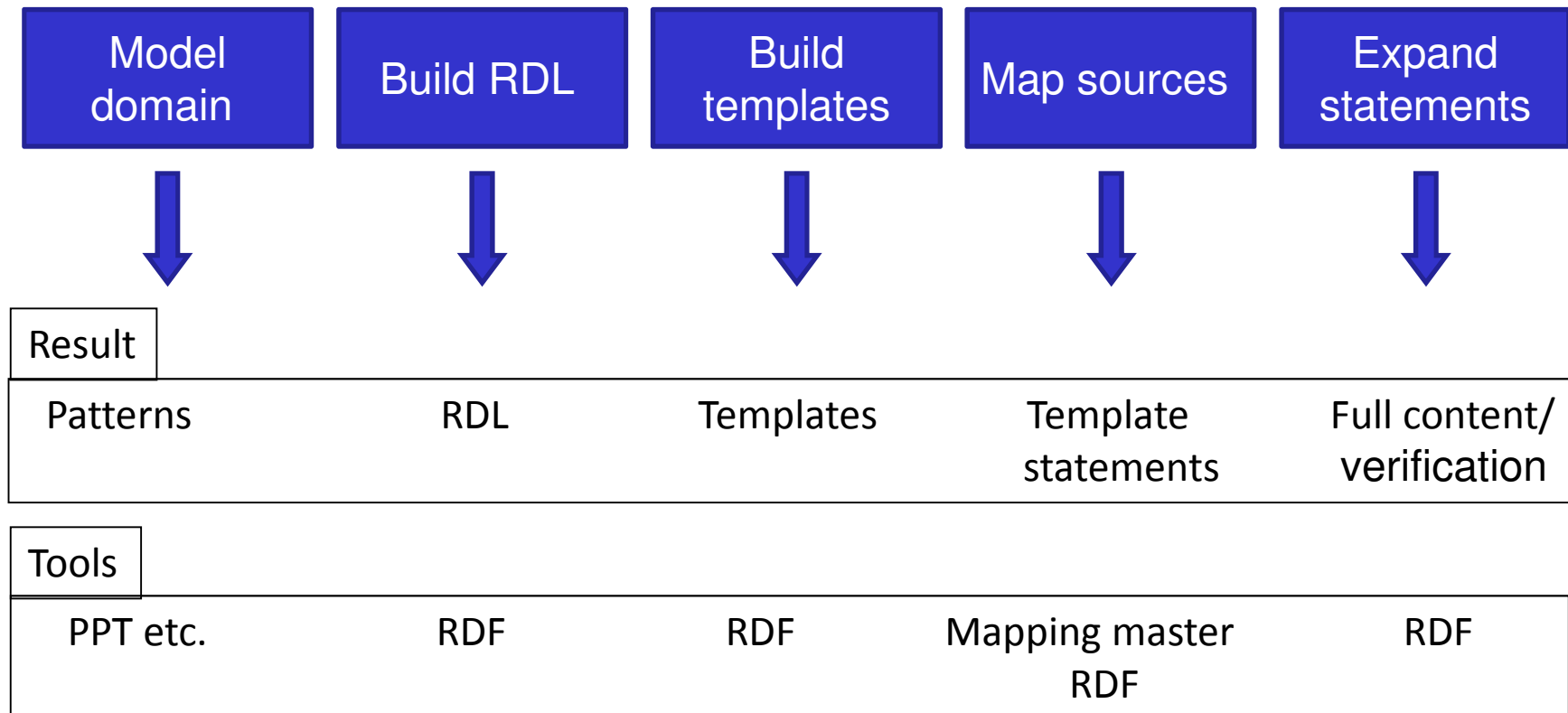
NORSOK		INSTRUMENT DATASHEET P01 PRESSURE / DIFF. PRESSURE INSTRUMENT ELECTRIC		SHARECAT NOT PART AND SHOULD BE EXCLUDED		Datasheet Transmitter, Pressure, Electric	
Tag number :	Scale Range :	Service description :	Set/Alarm Point :	Document Number :	28-1A-KOG-I54-27500-0012	Revision :	1
P&ID :	Area :	Line/equipment no. :	P. O. Number :	Plant/Platform :	Test Installation 2	Process Datasheet No. :	N/A
1 GENERAL				5 TRANSMITTER			
1.01 Type :	5.01 Indicator :	1.02 Manufacturer :	5.02 Output signal :	Tag number :	PT -42-0304	System :	N/A
1.03 Manufacturer model no. :	5.03 Communication :	1.04 Operating Temp. Limits :	5.04 Supply voltage :	SerialNo :	N/A	Range From :	0
1.05 Mounting :	5.05 Consumption :	1.06 Weight :	5.06 Load limitation :	SetPoint Low :	10 barG	Range To :	110
1.07 Other :	5.07 Other :	2 INSTRUMENT CHARACTERISTICS		SetPoint High :	71 barG	Range Unit :	barG
2.01 Calibrated input range :	6.01 Reset; automatic or manual :	2.02 Characteristic :	6.02 Deadband or differential :	P & ID :	28-1A-KOG-C78-00275-0002	Area :	N/A
2.03 Accuracy :	6.03 Alarm at increase/decrease :	2.04 Repeatability :	6.04 Contact configuration :	Line/Equipment no. :	XX-42-0002	PO :	T12-M022-ME-01
2.05 Lower / upper range limits :	6.05 Contact material :	2.06 Min / max span :	6.06 Contact rating :	Service description :	SCALE INHIBITOR. PUMP OUTLET	<small>1. Accepted</small> <small>2. Accepted with comments incorporated</small> <small>3. Not accepted, revise and resubmit</small> <small>4. Issued for information</small> <small>5. Interface information as clouded is accepted and frozen</small>	
2.07 Zero adjustment :	6.07 Contact action on alarm :	2.08 Overpressure protect. to :	6.08 Other :	Unique no. :	TEK-00018117	Date:	1 2 3 4 5
2.09 Max static pressure :	6 SWITCH		6.01 Reset; automatic or manual :	Manufacturer :	EMERSON PROCESS MANAGEMENT	Sign:	
2.10 Other :	6.02 Deadband or differential :	6.03 Alarm at increase/decrease :	6.04 Contact configuration :	Type :	3051CG		
3 ELEMENT / SENSOR		6.05 Contact material :	6.06 Contact rating :	Manuf. Partno. :	3051CG-5-A-2-2-A-1-K-B4-I1-L4-M6-Q4		
3.01 Type :	6.07 Contact action on alarm :	6.08 Other :	7 CHEMICAL SEAL		Class :	Transmitter, Pressure, Electric	
3.02 Material, element (sensor) :	7.01 Type :	3.03 Material, socket (inlet port) :	7.02 Material, upper/lower part :	7.02 Material, upper/lower part :	Explosion protection :	General	
3.04 Material, sensor bolts/nuts :	7.03 Material, bolts / nuts :	3.05 Process conn. size/type :	7.04 Material, diaphragm :	7.03 Material, bolts / nuts :	Gas-group :	Description : Gauge	
3.06 Other service spec. :	7.04 Material, diaphragm :	3.07 Other :	7.05 Fill fluid :	7.04 Material, diaphragm :	Temperature class :	Description : Smart, hart protocol	
3.07 Other :	7.05 Fill fluid :	4 HOUSING		7.06 Capillary length/diameter :	Approval authority :	Supply : 10.5 - 55 V DC	
4.01 Dimension :	7.06 Capillary length/diameter :	4.02 Material :	7.07 Material, capillary/armour :	7.07 Material, capillary/armour :	Certificate :	Mounting : Coplanar flange bracket for pipe or panel	
4.03 Cable connection :	7.07 Material, capillary/armour :	4.04 Cable entry :	7.08 Process conn. size/type :	7.08 Process conn. size/type :	IP-Class :	Material	
4.05 Enclosure protection :	7.08 Process conn. size/type :	4.06 Ex. classification :	7.09 Other :	7.09 Other :	ATEX group :	Body material : Stainless steel	
4.07 Protective coating :	7.09 Other :	4.07 Protective coating :	ACCESSORIES		ATEX category :	Filling fluid : Silicone oil	
4.08 Other :	8.01 Material, overpr. prot. valve :	4.08 Other :	8.01 Material, overpr. prot. valve :	8.01 Material, overpr. prot. valve :	ATEX explosive atmosphere :	Seal material : Glass filled TFE	
				8.02 Material, pulsation damper :	Ambient temperature :	Process connection material : Stainless steel	
				8.07 Other :	-40 - 85 °C	Non process cover material : 316	
				Dimensions and Weight		Flange bolt material : 316 AUSTENITIC	
				Weight :	4.7 kg	Drain/vent material : Stainless steel	
				Function		Diaphragm material low pressure : 316L	
				Range :	0 - 13800 kPa	Diaphragm material high pressure : 316L	
				Span limit minimum, Pressure :	138 kPa	Bracket material : Stainless steel	
				Span limit maximum, Pressure :	13800 kPa	Bracket bolt material : Stainless steel	
				Alternative Range :	0 - 138 bar	Adapter bolt material : 316 AUSTENITIC	
				Alternative span limit minimum, Pressure :	1.38 bar	Process Connection	
				Alternative span limit maximum, Pressure :	138 bar	Connection design : NPT	
				Output signal :	4 - 20 mA	Size : 1/4"	
				Accuracy :	±0.075 %	Thread pitch : 18 thr/in	
				Display type :	LCD	Supply Connection	
				Static working pressure :	3626 psi	Supply connection design : Metric threaded	
				Comment		ize : 20 mm	
				ANSI/ASME B1.20.1 1/4 - 18 NPT-F		1.5 mm/thr	
				Revision 18-36			
				thin transmitter temperature			
				flange Intrinsic Safety and			
				0%, 25%, 50%, 75%, and 100%			
Rev.	Date	Issue/description	Prepared	Checked	Approved	Datasheet no.	Page
1	09.11.2006 14:44	Generated by SHARECAT P.M.					
Rev.	Date	Issue/description	Prepared	Checked	Disc. Appr.	Client. Appr.	Page 1 of 1

Representation 1, Context 1

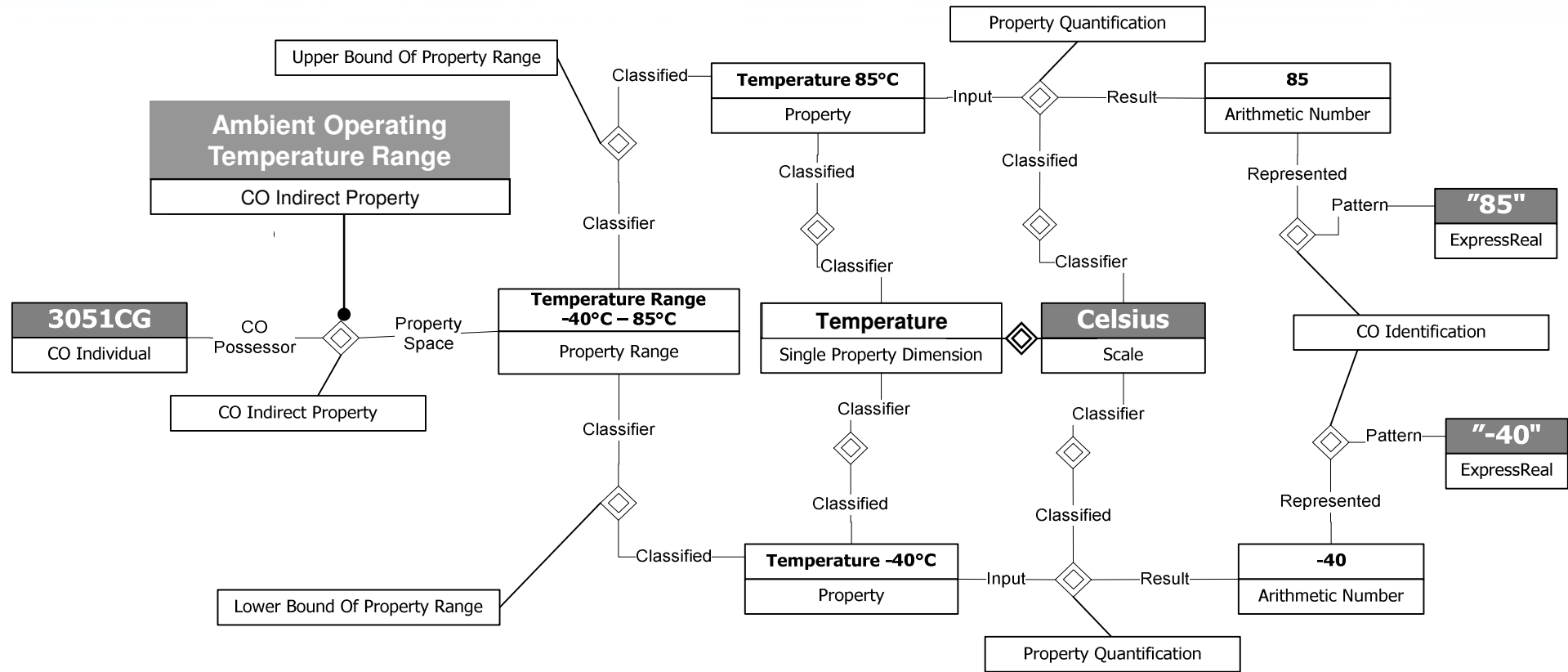
Representation 2, Context 2

ANSI/ASME B1.20.1 1/4 - 18 NPT-F

Process description

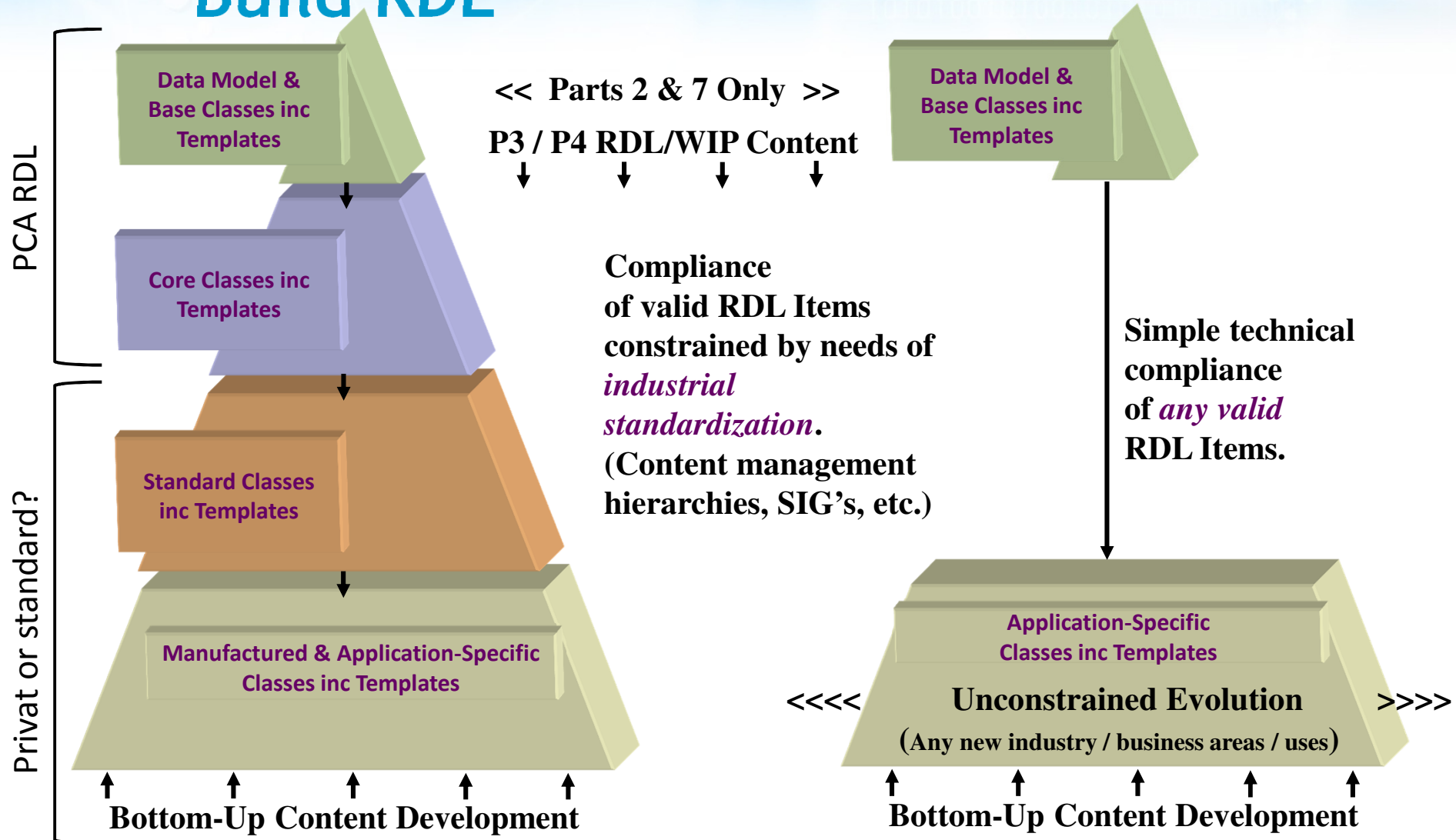


Model domain: Ambient Temperature Range



3051CG has a "ambient operating temperature": -40 C – 85 C

Build RDL



Build templates

Template signature



Template instance (fact)



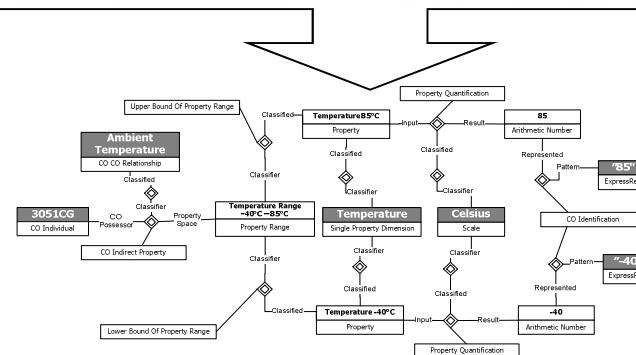
Temp. Inst. #	Something	Property Type	UoM	Input 1	Input 2
#jjj	3051CD	AMBIENT OPERATING TEMPERATURE RANGE	C	-40	85
#jjj	3051CD	AMBIENT OPERATING TEMPERATURE RANGE	C	-40	85
#kkk	2051TG	AMBIENT STORAGE TEMPERATURE RANGE	C	-46	110

Template axiom



```

PropertyRangeMagnitudeRestrictionOfClass(x1, x2, x3, x4, x5) <->
  ClassOfIndividual(x1) &
  ClassOfIndirectProperty(x2) &
  Scale(x3) &
  ExpressReal(x4) &
  ExpressReal(x5) &
  exists u (PropertyRangeRestrictionOfClass(x1, x2, u) &
  exists y1 exists y2 (
    IdentificationByNumber(x4, y1) &
    IdentificationByNumber(x5, y2) &
    LowerUpperMagnitudeOfPropertyRange(u, x3, y1, y2))) .
  
```



Mapping is a multi-stage process

- **What is to be represented**

- **Format**

1. From a particular format determine which template signatures and classes to use to represent the types of statements represented by each label
 - This involves amongst other inspecting the source to identify the “implicit” object types
 - Identify shortcuts one might want to use to avoid representation “overkill”
2. For potential new template signatures, define its corresponding expansion to full Part 2/3/4 representation.
3. Which options are involved for types of objects represented using the format?

- **Content**

- To define the actual relationships that a particular “object” represented using a datasheet format involves, e.g. which particular relationships applies for “3051CG-5-A-2-2-A-1-K-I1-M6”

- **How to implement**

1. Template signatures for data exchange or “format compliant” storage
2. Full expansion to Part 2/4/RDL compliant data store

(Need this also for 1. for verification)