5.11   Physical Measurement Unit (Unit, UnitGroup)

A `Unit` defines a physical measurement unit. A name to be displayed in documents and tools can be defined. All units are derived from SI Units. In order to convert one unit into another, the attributes `factorSiToUnit` and `offsetSiToUnit` can be defined:

$$unit = siUnit * factorSiToUnit + offsetSiToUnit$$

The unit itself may be associated with a `PhysicalDimension`. →5.13

Unit			
Multiplicity kind	**Attribute**	**ARXML tag**	**Description**
[1] ref	shortName	*SHORT-NAME*	Reference to an `Identifier` that can be referred to by other `ARElements`. Naming conventions apply. →4.4
[0..1] aggr	longName	*LONG-NAME*	Optional `MultilanguageLongName` of the object. →4.5
[0..1] attr	category	*CATEGORY*	The `category` attribute is only one element of the `Identifiable` parameters. For more details →4.3
[0..1] aggr	displayName	*DISPLAY-NAME*	This specifies how the unit shall be displayed in documents or in user interfaces of tools. ASAM MCD-2MC file. →14
[0..1] attr	factorSiToUnit	*FACTOR-SI-TO-UNIT*	Optional factor for the conversion from and to SI Units as explained above. →5.12
[0..1] attr	offsetSiToUnit	*OFFSET-SI-TO-UNIT*	Optional offset for the conversion from and to SI Units as explained above. →5.12
[0..1] ref	physicalDimension	*PHYSICAL-DIMENSION-REF*	Optional reference to a `PhysicalDimension`. →5.13

Table 5-52 Unit

ARXML syntax of a `Unit` **Hr** with

- `longName` **Hour**
- `factorSiToUnit` set to **0.000277777777777778** (equal to 1/3600 as one hour has 3600 seconds)
- reference to the `physicalDimension` **Ti1**

```
<UNIT>
  <SHORT-NAME>Hr</SHORT-NAME>
  <LONG-NAME>
    <L-4 L="EN">Hour</L-4>
  </LONG-NAME>
  <DESC>
    <L-2 L="EN">SI derived unit of hour</L-2>
  </DESC>
  <FACTOR-SI-TO-UNIT>0.000277777777777778</FACTOR-SI-TO-UNIT>
  <PHYSICAL-DIMENSION-REF DEST="PHYSICAL-DIMENSION">/common/Ti1</PHYSICAL-DIMENSION-REF>
</UNIT>
```

ARXML syntax of a `Unit` **MtrPerSec** with

- `longName` **Meter Per Second**
- `factorSiToUnit` set to **1.0** (as m/s equals the SI unit)
- reference to the `physicalDimension` **Len1TiNeg1**

```
<UNIT>
  <SHORT-NAME>MtrPerSec</SHORT-NAME>
  <LONG-NAME>
    <L-4 L="EN">Meter Per Second</L-4>
```