



Australian Government
Department of Industry,
Science and Resources

**National
Measurement
Institute**

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval
NMI 13/1/29

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that an approval for use for trade has been granted in respect of the instruments herein described.

VITRONIC model VIPAC D2-BNPS dimensional measuring instrument

submitted by VITRONIC Dr.-Ing. Stein Bildverarbeitungssysteme GmbH
Hasengartenstraße 14
65189 Wiesbaden
GERMANY

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

This approval has been granted with reference to document NMI R 129, *Multi-dimensional Measuring Instruments*, dated July 2004.

This approval is subject to review at the decision of the Chief Metrologist in accordance with the conditions specified in the document NMI P 106.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern and variants 1 & 2 approved – certificate issued	27/04/17
1	Variant 3 & 4 approved – certificate issued	17/01/25

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 13/1/29' and only by persons authorised by the submitter.

It is the submitter's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the National Measurement Institute (NMI) and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with document NMI P 106.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificate No S1/0B.

Special: For the pattern and all variants

Instruments are only approved for use for determination of the dimensions and volume of the smallest rectangular box that could contain an object, for the purposes of determining freight or postal charges.

The dimensions determined may also be used for the calculation (by peripheral equipment) of a volume and/or 'dimensional weight' (*) value of the object, also for the purposes of determining freight or postal charges.

- (*) A '**dimensional weight**' value is a calculated value deemed to be a weight value obtained by applying a conversion factor to the object's volume as calculated from the measured dimensions.

Signed by a person authorised by the Chief Metrologist to exercise their powers under Regulation 60 of the *National Measurement Regulations 1999*.



Darryl Hines
Manager
Policy and Regulatory Services

TECHNICAL SCHEDULE No 13/1/29

1. Description of Pattern

approved on 27/04/17

A VITRONIC model VIPAC D2-BNPS dimensional measuring instrument (Figure 1) which is approved for use for the determination of the linear dimensions of certain objects while they are in motion.

Instruments are approved for use over a temperature range of -10°C to +55°C and must be so marked.

1.1 Details

The instrument is approved for use for the determination of the linear dimensions of irregular shaped objects having maximum dimensions (i.e. length x width x height) of 2500 x 1000 x 1000 mm and minimum dimensions 100 x 100 x 100 mm, with a scale interval of measurement (d) of 10 x 10 x 10 mm and a belt speed (V_{max}) of up to 180 m/min.

The pattern converts the detected characteristics into the linear dimensions of the smallest rectangular box (parallelepiped – #) that would fully contain the object.

The pattern is approved for use in measuring the linear dimensions of opaque objects only; the dimensions determined may also be used for the calculation of volume and/or 'dimensional weight' value (*) of the item (refer to the Special Conditions of Approval).

Note: This instrument is NOT suitable for:

- transparent objects and objects packed in thick, transparent wrapping material, e.g. 'bubble wrap'; or
- Objects with a mirror-like surface, e.g. chrome or other high gloss finish,

however, the instrument can measure objects covered in shiny sealing tape or glossy plastic wrapping, e.g. 'cling wrap'.

(#) A rectangular box (parallelepiped) is a polyhedron having six faces that are parallel in pairs; each face is a parallelogram and adjacent edges are perpendicular.

(*) A '**dimensional weight**' value is a calculated value deemed to be a weight value obtained by applying a conversion factor to the object's volume as calculated from the measured dimensions.

1.2 Dimensioning System

The pattern includes two VITRONIC model VOLUMECH^d sensors (Figure 2) mounted above a belt-conveyor type load receptor and are interfaced to an industrial PC which operates ViLogger software version 3.2.1 or 4.2.11.

The sensors are laser based optical scanners which measure the reflected light and with signals from the encoder, is analysed by the ViLogger software on the PC to determine the linear dimensions of the object. Measurement results are output to the touch screen display connected to the PC (Figure 3).

1.3 Speed Sensing System

The instrument uses a Photocraft model RH-P600AJ or a Fritz Kübler model Sendix 5000 encoder or equivalent (*) to measure the length of the object in combination with the VOLUMEC^{hd} sensors. The encoder is fitted to contact the conveyor belt, usually underneath where it can't be struck by packages, and generates pulses based on the displacement of the belt while the laser dimensioning head detects the object being measured.

- (*) Equivalent' is defined to mean other proprietary equipment of the same or better specifications requiring no changes to the software specified in this approval for satisfactory operation of the system

1.4 Indications

A LCD touch screen display (Figure 3) is connected to the PC for indication of measurement results. The indicator is also used to operate and configure the instrument and displays any error messages that occur during a measurement operation.

Indicator lamps may be fitted to signal when the system is operating, a measurement is in progress or an error has been detected.

The pattern is fitted with a touch screen display however measurement data is also made available to other systems for indication and/or printing.

Where other systems are interfaced to the instrument, printed and displayed information must be made available for verification and must comply with the requirements set out in document NMI R129, *Multidimensional Measuring Instruments*, in particular as per the extract below.

7.9.1 Any printed ticket or displayed indication shall include sufficient information to identify the transaction, for example:

- (a) dimensions: length (L), width (W) and height (H);
- (b) volume (vol);
- (c) weight (Wt) if the instrument includes a weighing instrument;
- (d) dimensional weight (Dim Wt ... kg or DW ... kg);
- (e) dimensional tare (DT ... kg);
- (f) conversion factor (F);
- (g) quantity for charging, for example dimensions, vol or DW ... kg;
- (h) price rate and price; and
- (i) date, transaction number or other identification of the object.

Note 1: Icons may be used to identify indications.

Note 2: When the customer is not present during the measurement process the above information need not be displayed or printed out at the time but shall be available on request.

Note 3: The price interval and the price rate shall comply with the national regulations applicable for trade.

7.9.2 A printed ticket shall also contain the following printed or pre-printed information:

- (a) that the dimensions and/or volume shown are those of the smallest rectangular box that fully encloses the object; and
- (b) that the dimensional weight is a calculated value deemed to be a weight value obtained by applying a conversion factor to the object's volume or dimensions.

1.5 Additional System Facilities

The system may interface with other facilities such as barcode reading systems. The facilities shall not interact with the system in a way that would cause an incorrect indication of the measurement result.

1.6 Sealing Provision

Provision is made for sealing the calibration adjustments in software using checksum of the configuration files. The checksum information is accessed from the "Info" tab of the ViLogger software.

Provision is also made for sealing the VOLUMECH^d sensors, the VITRONIC Sorter speed measurement control box and the cabinet containing the Industrial PC by means of adhesive sealing labels. (Figure 4)

1.7 Verification Provision

Provision is made for the application of a verification mark.

1.8 Descriptive Markings and Notices

- (a) Instruments carry the following markings (in the vicinity of the indicating device):

Manufacturer's mark, or name written in full	VITRONIC
Model designation
Serial number of the instrument
Year of manufacture
Pattern approval number for the instrument	NMI 13/1/29
Maximum dimensions for each axis	<i>Max</i> mm
Minimum dimensions for each axis	<i>Min</i> mm
Scale interval	<i>d</i> = mm
Maximum belt speed	<i>Max</i> m/sec or m/min
Minimum belt speed	<i>Min</i> m/sec or m/min
Special temperature limits	-10°C to +55°C

- (b) Instruments carry one or more notices stating CERTAIN REFLECTIVE OR TRANSPARENT ITEMS CANNOT BE MEASURED, or similar wording.

- (c) Instruments of variant 2 carry one or more notices stating 'TO BE USED FOR RECTANGULAR BOX SHAPED OBJECTS ONLY', or similar wording.

2. Description of Variant 1

approved on 27/04/17

A VIPAC D2-CNPS which is similar to the pattern for use with a crossbelt sorter conveyor system.

This instrument measures irregular shaped objects having maximum dimensions (i.e. length x width x height) of 1600 x 1500 x 1000 mm and minimum dimensions 100 x 100 x 100 mm, with a scale interval of measurement (d) of 10 x 10 x 10mm and a belt speed (V_{max}) of up to 180 m/min.

The Speed Sensing System of clause 1.3 is replaced with the VITRONIC Sorter speed measurement control box (Figure 5) which uses light barriers to detect the movement of the conveyor and simulates the encoder signal.

3. Description of Variant 2

approved on 27/04/17

Certain other models and with characteristics as listed in Table 1.

TABLE 1

Model	VIPAC D2-BCPS		VIPAC D2-CCPS	
Conveyor System	Belt conveyor		Crossbelt conveyor	
Number of VOLUMECH ^d sensors	1 sensor	2 sensors	1 sensor	2 sensors
	length x width x height		length x width x height	
Maximum dimensions	2500 x 1000 x 1000 mm	2500 x 1000 x 1000 mm	1600 x 1000 x 1000 mm	1600 x 1500 x 1000 mm
Minimum dimensions	100 x 100 x 20 mm	50 x 50 x 20 mm	100 x 100 x 50 mm	50 x 50 x 50 mm
Scale Interval	10 x 10 x 2 mm	5 x 5 x 2 mm	10 x 10 x 5 mm	5 x 5 x 5 mm

The variant is approved for use for the determination of the linear dimensions of rectangular box-shaped (parallelepiped (#), cuboidal) objects only.

Models using a crossbelt conveyor (Figure 6) use the Speed Sensing System as described in Variant 1.

The variant is required to carry the notice described in clause **1.8 (c)**

- (#) A rectangular box (parallelepiped) is a polyhedron having six faces that are parallel in pairs; each face is a parallelogram and adjacent edges are perpendicular.

4. Description of Variant 3

approved on 17/01/25

The VIPAC D xCVS (Figure 7) which is similar to the pattern and with models and characteristics as listed in Table 2.

TABLE 2

Model	VIPAC D BCVS		
Conveyor Type	Belt conveyors or any conveyor that has a flat surface		
Speed Measurement	Encoder as described in 1.3 Speed Sensing System		
Maximum Dimensions	Length	Width	Height
	2500 mm	1000 mm	1000 mm
Minimum Dimension	50 mm	50 mm	20 mm
Scale Interval (d)	5 mm	5 mm	2 mm (Range 1) 5 mm (Range 2)
Model	VIPAC D CCVS		
Conveyor Type	Crossbelt sorters or any sorter-like conveyor that has a flat surface		
Speed Measurement	VITRONIC Sorter speed measurement control box as described in Variant 1		
Maximum Dimensions	Length	Width	Height
	2500 mm	1200 mm (1 Sensor) 1500 mm (2 sensors)	800 mm
Minimum Dimension	50 mm	50 mm	20 mm
Scale Interval (d)	5 mm	5 mm	2 mm (Range 1) 5 mm (Range 2)
Model	VIPAC D TCVS		
Conveyor Type	Tray-equipped conveyors with entirely or partially visible and uniform tray		
Speed Measurement	VITRONIC Sorter speed measurement control box as described in Variant 1		
Maximum Dimensions	Length	Width	Height
	2500 mm	1000 mm	1000 mm
Minimum Dimension	50 mm	50 mm	20 mm
Scale Interval (d)	5 mm	5 mm	2 mm (Range 1) 5 mm (Range 2)
Multiple measuring range (height axis only)	Range 1	20 mm to 50 mm	
	Range 2	50 mm to Maximum	

The variant is approved for use for the determination of the linear dimensions of rectangular box-shaped (parallelepiped (#), cuboidal) objects only. The variant is required to carry the notice described in clause 1.8 (c)

Models use one or two VOLUME HD 3.x sensor heads to record the dimension of objects. Measurement of objects on a conveyor may be done dynamically or statically in a start-stop scenario.

(#) A rectangular box (parallelepiped) is a polyhedron having six faces that are parallel in pairs; each face is a parallelogram and adjacent edges are perpendicular.

5. Description of Variant 4

approved on 17/01/25

The VIPAC D xNVS (Figure 7) which is similar to the pattern and with models and characteristics as listed in Table 3.

TABLE 3

Model	VIPAC D BNVS		
Conveyor Type	Belt conveyors or any conveyor that has a flat surface		
Speed Measurement	Encoder as described in 1.3 Speed Sensing System		
Maximum Dimensions	Length	Width	Height
	2500 mm	1000 mm	1000 mm
Minimum Dimension	50 mm	50 mm	20 mm
Scale Interval (d)	5 mm	5 mm	2 mm (Range 1) 5 mm (Range 2)
Model	VIPAC D CNVS		
Conveyor Type	Crossbelt sorters or any sorter-like conveyor that has a flat surface		
Speed Measurement	VITRONIC Sorter speed measurement control box as described in Variant 1		
Maximum Dimensions	Length	Width	Height
	2500 mm	1500 mm	800 mm
Minimum Dimension	50 mm	50 mm	20 mm
Scale Interval (d)	5 mm	5 mm	2 mm (Range 1) 5 mm (Range 2)
Model	VIPAC D TNVS		
Conveyor Type	Tray-equipped conveyors with entirely or partially visible and uniform tray		
Speed Measurement	VITRONIC Sorter speed measurement control box as described in Variant 1		
Maximum Dimensions	Length	Width	Height
	2500 mm	1000 mm	1000 mm
Minimum Dimension	50 mm	50 mm	20 mm
Scale Interval (d)	5 mm	5 mm	2 mm (Range 1) 5 mm (Range 2)
Multiple measuring range (height axis only)	Range 1	20 mm to 50 mm	
	Range 2	50 mm to Maximum	

The variant is approved for use for the determination of the linear dimensions of irregular shaped objects.

Models use two VOLUME HD 3.x sensor heads to record the dimension of objects. Measurement of objects on a conveyor may be done dynamically or statically in a start-stop scenario.

TEST PROCEDURE No 13/1/29

Note: Refer to clause **1.4 Indications** – Printed and displayed information must be made available for verification and must comply with the requirements set out in document NMI R 129, *Multi-dimensional Measuring Instruments*, dated July 2004.

The instrument shall not be adjusted to anything other than as close as practical to zero error, even when these values are within the maximum permissible errors.

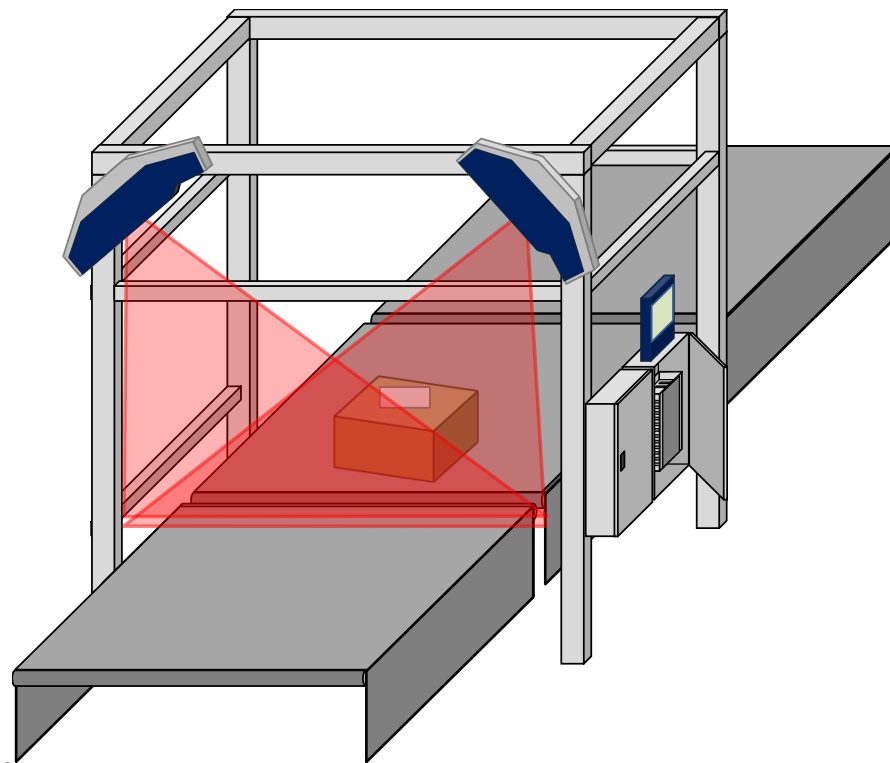
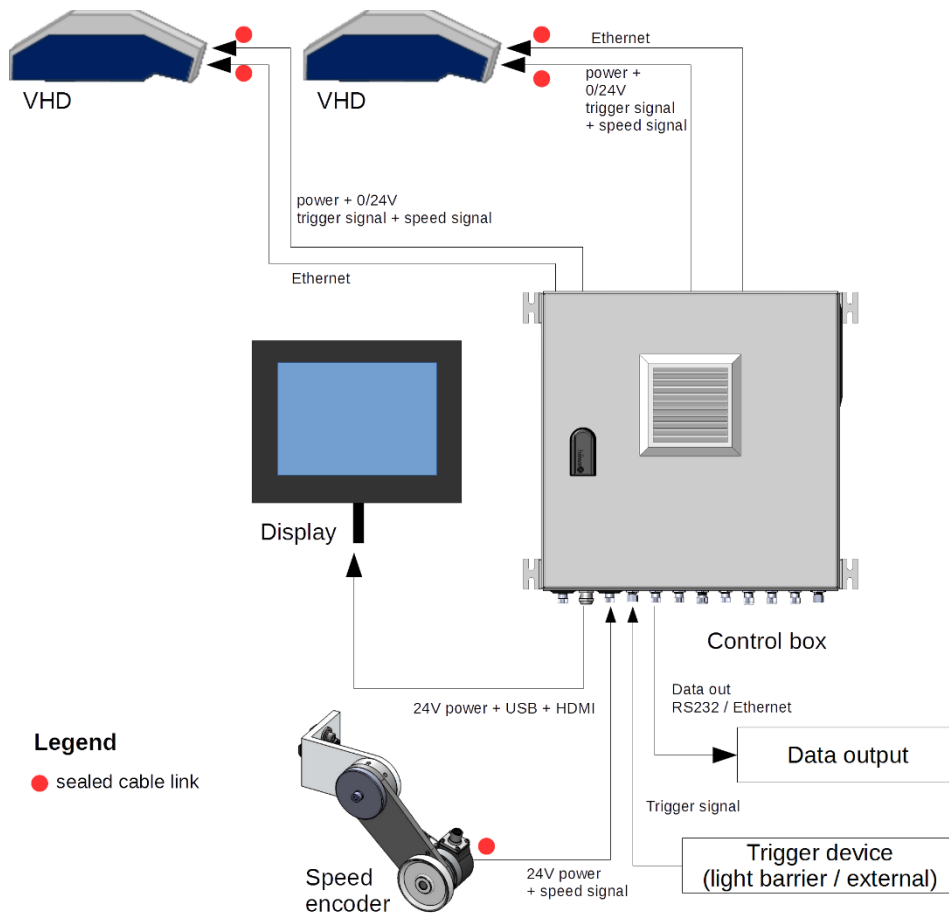
Maximum Permissible Errors

The maximum permissible errors are specified in Schedule 1 of the *National Trade Measurement Regulations 2009*.

Instruments shall be tested as follows:

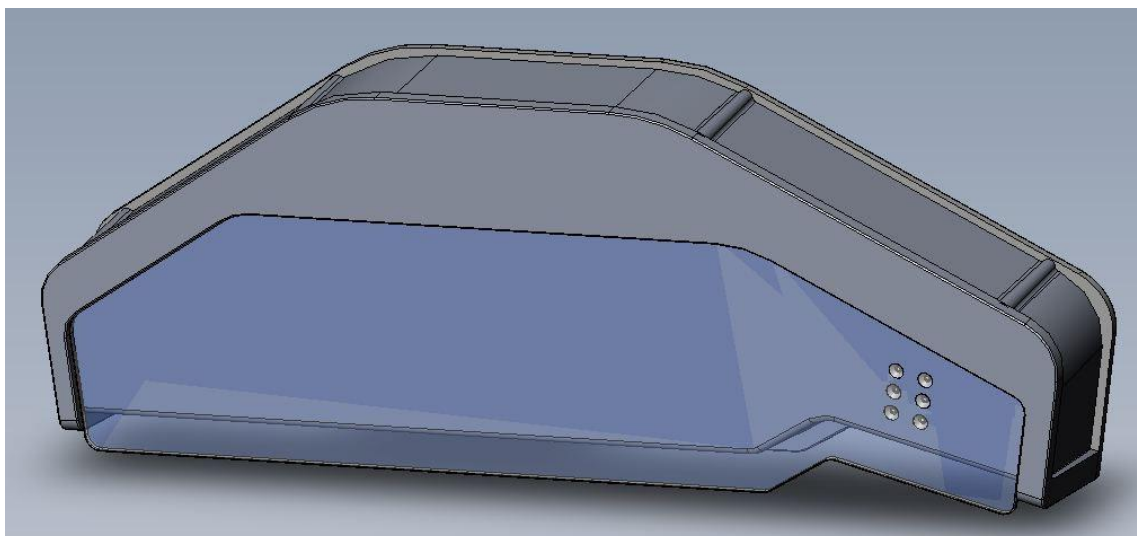
- (a) Test objects shall be used, in the shape of rectangular boxes with known linear dimensions such that each axis (i.e. length x width x height) is tested for at least five dimensions between and including the minimum and maximum dimensions (approximately) specified on the instrument nameplate. Each test object shall be non-sound absorbing, rigid and with flat faces and well-defined edges. All adjacent faces and edges shall be perpendicular to each other. The dimensions of the test objects shall be equal to $N \times d$ and the lengths shall be known to an uncertainty equal to or better than $\pm 1/5$ of the maximum permissible error, which is equal to the scale interval (d). N is a whole number.
- (b) Carry out at least three test runs for each length, varying position and orientation across the receptor. Each measurement shall be within the maximum permissible error.
- (c) Check that instruments carry one or more notices stating CERTAIN REFLECTIVE OR TRANSPARENT ITEMS CANNOT BE MEASURED, or similar wording.
- (d) Check that instruments carry one or more notices stating TO BE USED FOR RECTANGULAR BOX SHAPED OBJECTS ONLY, or similar wording. This notice is required for variant 2 models only.
- (e) Ensure that instruments are only being used within the special temperature limits stated elsewhere in this Technical Schedule.

FIGURE 13/1/29 – 1



VIPAC D2-BNPS (pattern)

FIGURE 13/1/29 – 2




VOLUMEC^{hd} sensor

FIGURE 13/1/29 – 3

Token	Date	Time	Length	Width	Height	EC
0001	2017-03-23	14:45:19	0595	0200	0058	0000000

Length 0595 mm
Width 0200 mm
Height 0058 mm
EC 00000000
UncertLf 0595.6 mm
UncertWf 0201.1 mm
UncertHf 0057.2 mm

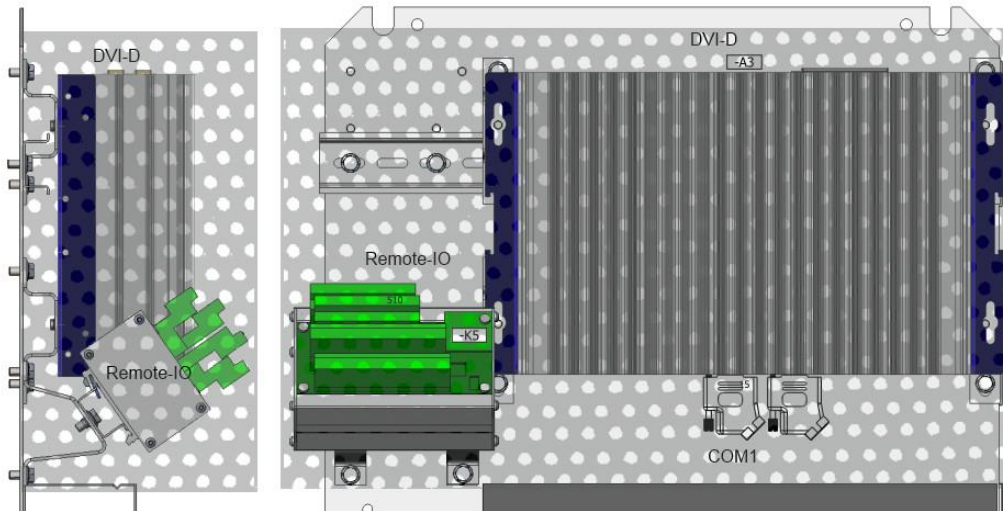
Data Menu

 **VITRONIC**
machine vision people

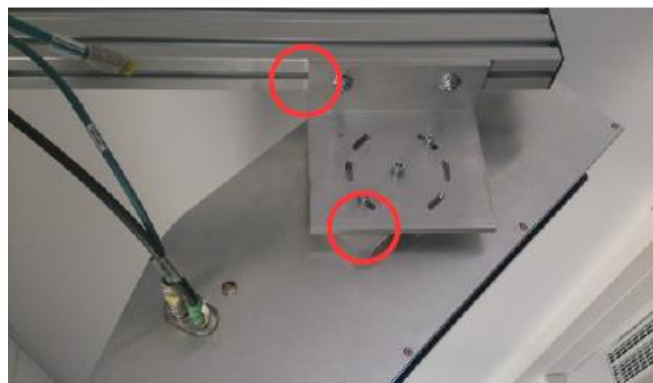
● Tunnel1 2017-03-23 14:45:31 UTC ...

Typical display

FIGURE 13/1/29 – 4



(a) Sample installation of PC and Remote-IO within protective cage



(b) VOLUME HD sensor mounting sealing points



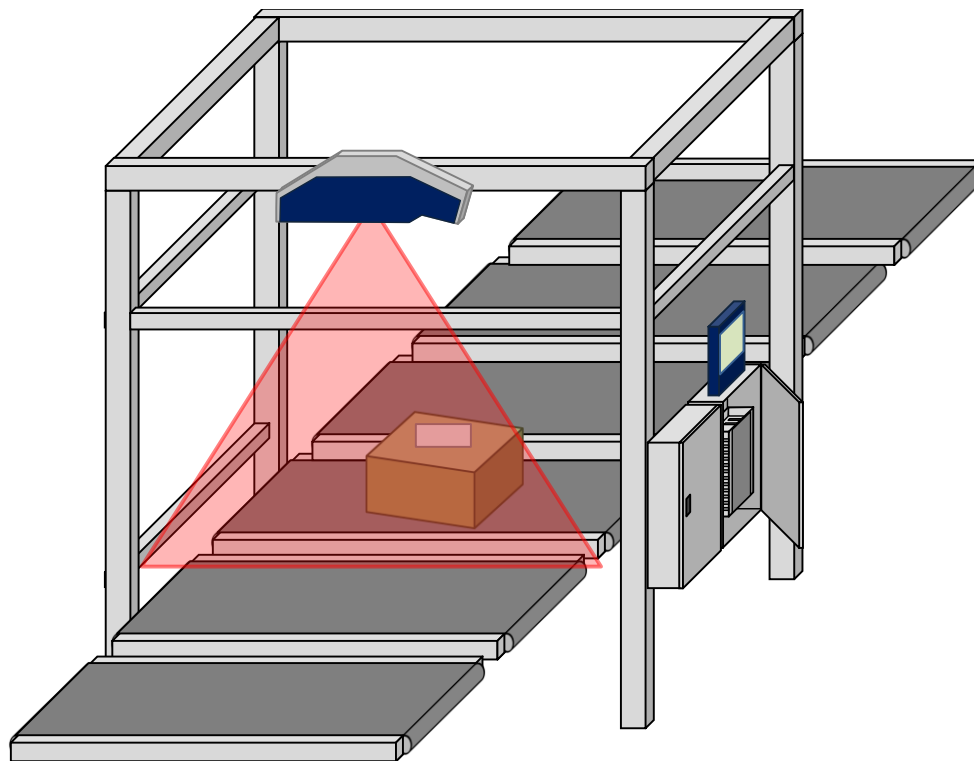
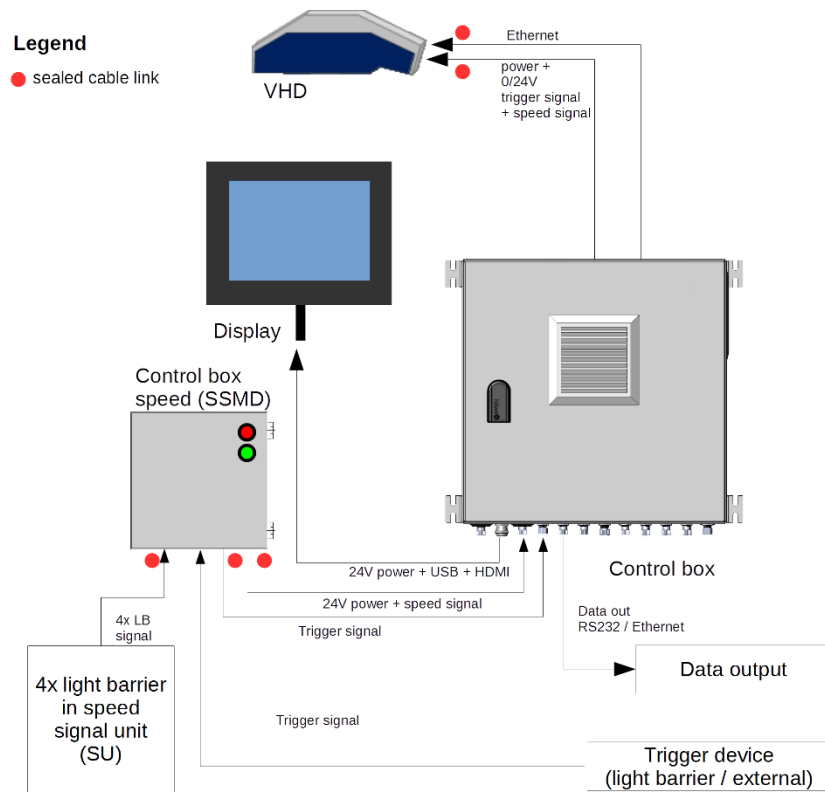
(c) VITRONIC Sorter speed measurement control box sealing points

FIGURE 13/1/29 – 5



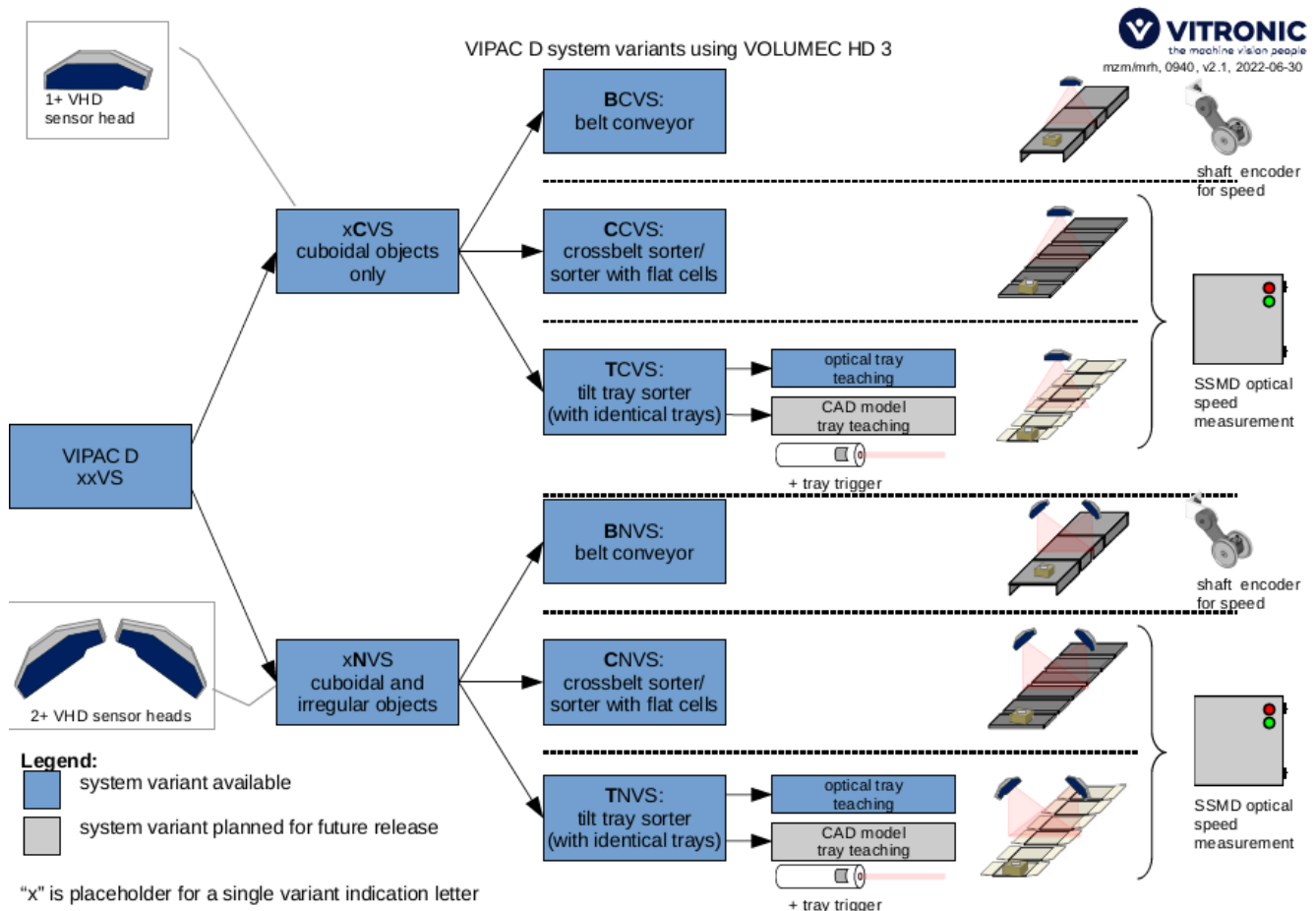
VITRONIC Sorter speed measurement control box

FIGURE 13/1/29 – 6



VITRONIC Model VIPAC D2-CCPS crossbelt conveyor with one sensor (Variant 2)

FIGURE 13/1/29 – 7



VITRONIC Model VIPAC D xCVS (Variant 3) and xNVS (Variant 4)

~ End of Document ~