



Technical specification 7039

V2.0



Classification	Final
Category	MP21
Area of responsibility	Production
Document owner	Production Manager



Document history

Version	Date	Author	Changes
V1.0	26.10.2021	S. Lüttich	Initial version Astyx MPS GmbH
V2.0	29.02.2024	S. Lüttich	Minor changes

Company history

The company Astyx GmbH has been sold February 2021 to GM Cruise. The microwave positioning sensor division has been carved out from Astyx GmbH and all products and services are now being provided by Astyx MPS GmbH in Germany and Verve Satcom Inc., our subsidiary in the United States.



Microwave sensor for 385 mm bore cylinder

Continuous and absolute measurement system for use in cylinders filled with Nitrogen (or compressed air). For use in hydraulic equipment.

Cylinder Bore/ Astyx MPS mark	385 mm / 7039
Measuring range	up to 17 meter
Non-Linearity	typ. ± 10 mm
Non-Linearity	max. ± 25 mm (calibrated, over 2m, 20°C)
Update frequency	> 125 Hz
Velocity	4 m/s max.
Deviation of absolute distance between 0bar and 5bar	at 10m position: ~ 100 mm
Operating voltage	18 ... 30 Vdc
Power	typical maximum 9 W absolute maximum 12 W
Customer interface	see ProfiBusDPCanSlaveGateway_Protocol_ReleaseSpec_v1.4_freigegeben
Frequency band	660 .. 715 MHz, < 5 mW, wave guided
Medium	Nitrogen
Operating pressure	10 Bar max.
Test pressure	100 Bar max.
Vibration	10 Hz - 60 Hz with ± 0.35 mm, 1 oct/min, number of 5 cycles 60 Hz - 150 Hz with 5 g sine according IEC 68 part 2-6, 1 oct/min, number of 5 cycles
Shock	30 g, 11 ms half sine according IEC 68 part 2-27, number of 3 each direction 15 g, 6 ms half sine according IEC 68 part 2-29, number of 1000 each direction
Operating temperatures:	
Antenna	- 20 °C .. + 55 °C
Evaluation Box	- 20 °C .. + 40 °C
Storage temperature	- 25 °C .. + 70 °C

Usage requires sensor to cylinder calibration by ASTYX.

The Microwave Sensor may only be used with special designed cylinders released by ASTYX.



Antenna module

The antenna module has to be installed properly to a cylinder according required mechanical interface description. To reduce the influence of liquid inside the measuring area, the piston requires a special designed cover plate. The antenna module is installed in a downward direction. For operation the Evaluation Box is needed.

Housing	Stainless steel AISI 316 / 1.4401
Antenna	Stainless steel AISI 316 / 1.4401
Dimensions	Ø160 x 160 mm
Weight	< 15 kg
IP class	IP67

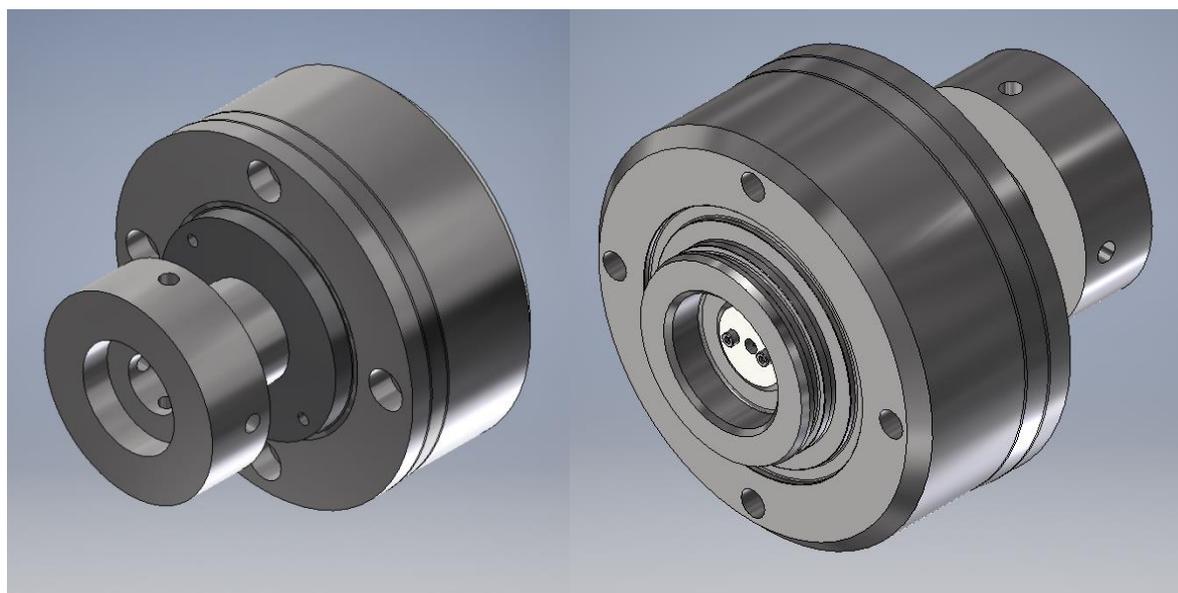
Conformity 2014/34/EU (ATEX)

Explosion safety II 3G Ex ec IIB T4 Gc

Antenna Cable Huber & Suhner Enviroflex 142
Cable length to FPH 2750 mm. Protect SMA cable against environmental impact for use under harsh conditions.

Recommended backside sealing (not delivered)	91.67x3.53, NBR 90 Shore A or 72.62x3.53, NBR 90 Shore A
Recommended mounting bolts (not delivered)	DIN EN ISO 4762 M10x80, A4-70 (stainless steel)

Electrical Interface see Manual





Evaluation Box

The Evaluation Box operates together with an antenna module. It carries the software and device dependent calibration data. Device means a fix combination of antenna module, Evaluation Box and cylinder.

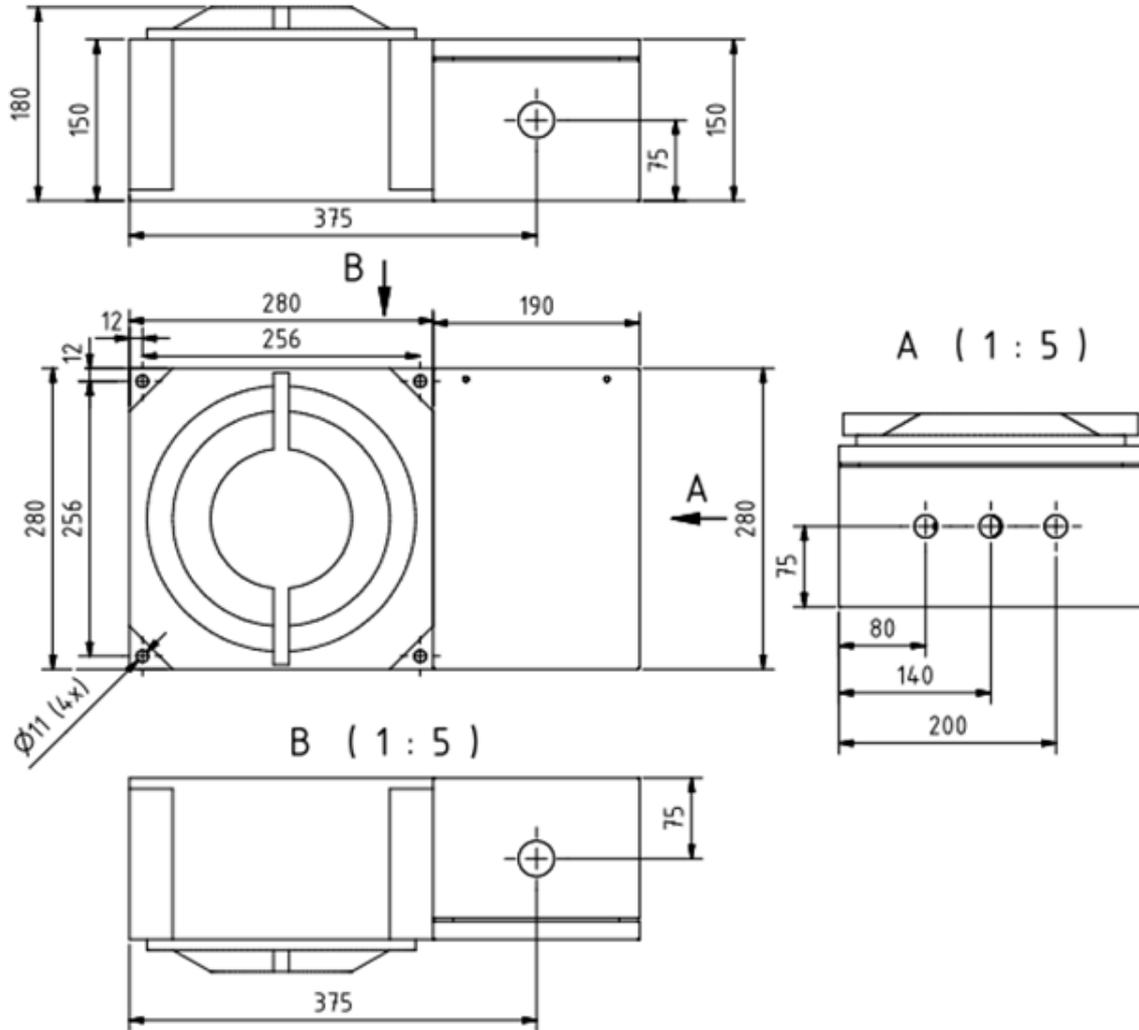
Housing	Stainless steel AISI 316L / 1.4404 Technor TNCD282815 Ex d enclosure Technor TNCN281915 Ex e connection enclosure
Power Gland	Hawke 501/453/Universal A M20
Recommended cable	DRA-1003 4pair 0.75 (not delivered)
Communication Gland	Hawke 501/453/Universal O M20
Recommended cable	LAP-1007 1pair (not delivered)
Drain Plug M20	
Antenna Cable Gland	Hawke SB474/C-M32-M32
Dimensions	280 mm x 470 mm x 150 mm
Weight	< 45 kg
IP class	IP66
EMC / EMI of	Radiated Emission Electric Field, 30 MHz to 1 GHz, CISPR 11:2003/A2:2006
Build-in Electronic Box	Immunity to radiated electromagnetic fields, 80 MHz to 2,7 GHz 10 V/m, IEC 61000-4-3:2006 Immunity to electrostatic discharges, IEC 61000-4-2:1995 +A1:1998 +A2:2000 Immunity to electrical fast transients, IEC 61000-4-4:2004 Immunity to asymmetric RF, 150 kHz to 80 MHz
Conformity	2014/34/EU (ATEX)
Explosion safety	II 2(1)G Ex de [ia] IIC T6 Gb
Electrical Interface	see Manual

Included equipment:

- A Security line of stainless steel with around 60 cm length for cover of Exd enclosure.
- A vapour space inhibitor is provided inside the FPH.



Dimensions of the Evaluation Box





Warning!

- Voltages higher than 30 Vdc applied to any of the electrical connection points might damage the sensor electronics.
- Mechanical contact between antenna and piston will damage the sensor.
- Calibration of the sensor in a cylinder with identical geometrical properties (bore, piston geometry) is required after mounting.
- Fluid on top of the piston or in the antenna will influence measurements and might cause unexpected offset changes in the output signal.
- Opening of enclosures or disassembly of the microwave sensor is allowed to authorized staff only.



Danger !

- An ESD discharge from the piston rod to the microwave antenna has to be prevented, as it might damage the evaluation box.
- Never power up the sensor outside the grounded cylinder or without proper shielding against electromagnetic radiation (refer to local authorities for applicable regulations).
- A damaged sensor (antenna or evaluation box) may not be powered or used